

Report of the

43d NATIONAL CONFERENCE ON WEIGHTS AND MEASURES 1958



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NATIONAL BUREAU OF STANDARDS
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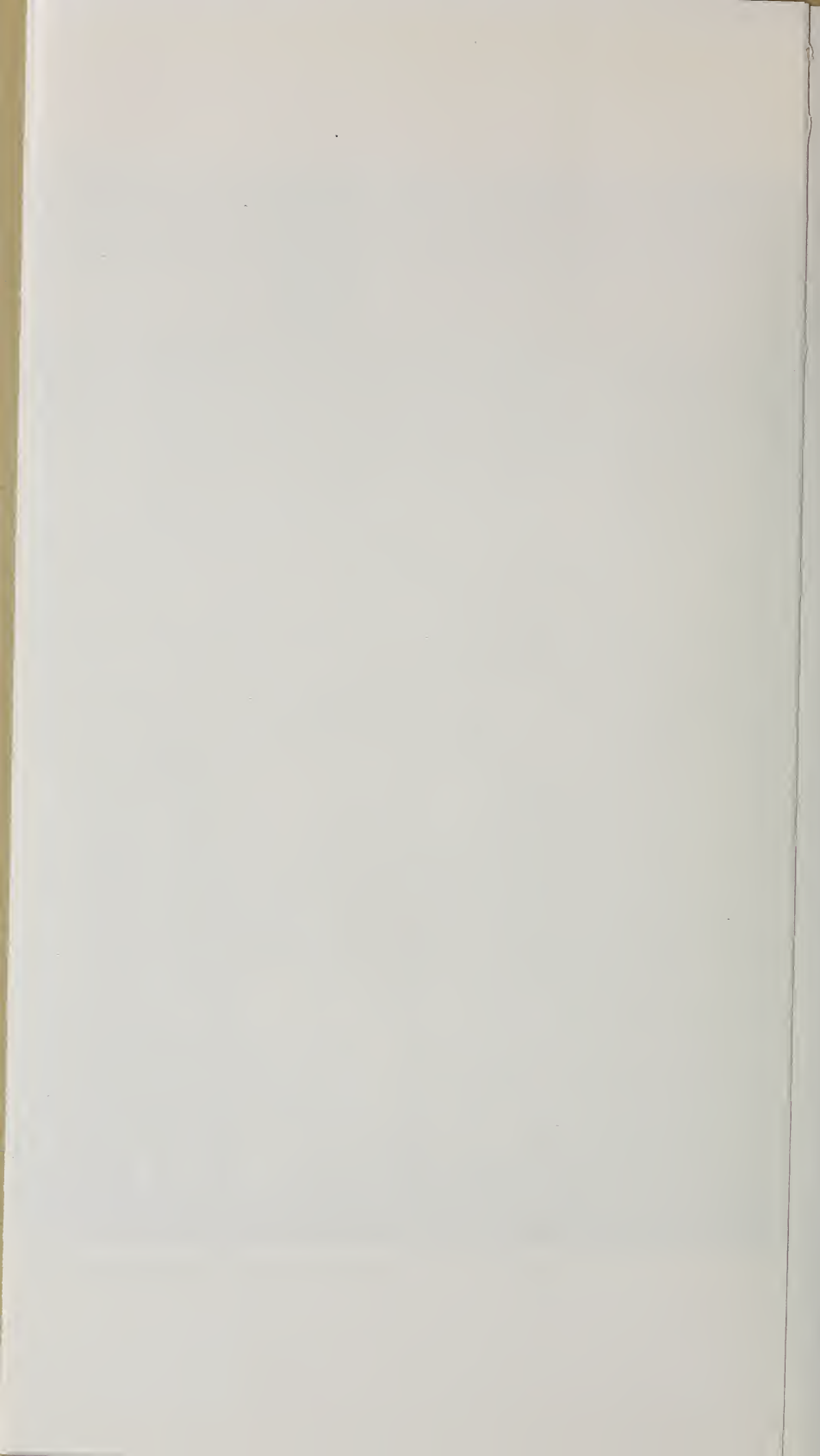
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Report of the 43d National Conference on Weights and Measures 1958

Attended by Representatives from Various States

Sponsored by the National Bureau of Standards

Washington, D. C., June 9, 10, 11, 12, 13, 1958



United States Department of Commerce • Sinclair Weeks, Secretary

National Bureau of Standards • A. V. Astin, Director

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Official photograph of delegates and guests attending the Forty-third National Conference on Weights and Measures, assembled on the grounds of the headquarters hotel.



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OFFICERS AND COMMITTEES

OFFICERS

(As elected by the Forty-second National Conference to serve during the Forty-third National Conference.)

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Secretary: W. S. BUSSEY, Chief, Office of Weights and Measures, } *Ex officio*
National Bureau of Standards.

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Treasurer: C. C. MORGAN, City Sealer of Weights and Measures, Gary, Indiana.

Chaplain: J. H. MEEK, Director, Division of Markets, Department of Agriculture and Immigration, State of Virginia.

(As elected by the Forty-third National Conference for the ensuing year.)

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Secretary: W. S. BUSSEY, Chief, Office of Weights and Measures, } *Ex officio*
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(As elected by the Forty-third National Conference.)

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W. B. STEELE, of Oregon.

STANDING COMMITTEES

(As constituted at the conclusion of the Forty-third National Conference, the personnel and organization of each of the standing committees of the Conference are as listed. As reported, the membership of each committee reflects the appointments made by the President of the Conference to fill vacancies that have occurred from expiration of term, and the elections by the several committees of chairmen for the ensuing year. The remaining term of office for each committee member, in years, is shown by the figure in parentheses following each entry.)

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Committee on Resolutions: A. R. FRASSINELLI, of Connecticut, Chairman; H. E. CRAWFORD, of Jacksonville, Florida; J. C. GOLL, of North Dakota; E. D. HUBBLE, of Monroe County, New York; E. L. RANDALL, of Nevada; W. E. G. RHEIN, of Cincinnati, Ohio; H. D. ROBINSON, of Maine.

Auditing Committee: J. E. MAHONEY, of Maryland, Chairman; LEONARD DERIENZO, of Englewood, New Jersey; H. A. LASON, of Binghamton, New York.

IN CHARGE OF LADIES' PROGRAM

MRS. W. S. BUSSEY, MRS. M. W. JENSEN, MRS. H. F. WOLLIN.

IN CHARGE OF REGISTRATIONS

MRS. F. C. BELL, MRS. E. L. BRUECKNER, MRS. M. M. BRODMERKEL, MISS JANE CUNNINGHAM.

PRESS REPRESENTATIVE

P. E. WALSH.

*W. S. BUSSEY, Secretary of the Conference, is *ex officio* nonvoting Secretary to each Committee.

COMMITTEE MEETINGS, MONDAY, JUNE 9, 1958

Monday was set aside for meetings, both open and executive, of the Conference committees. Announcements of the meetings on Monday were carried in all invitations, all pre-Conference publicity, and in the tentative and printed programs.

A large number of delegates took advantage of the committee meetings, and, as a result, attendance and participation were excellent.

The Conference committees that met on Monday were the Executive Committee, Committee on Laws and Regulations, Committee on Specifications and Tolerances, and Committee on Education.

REPORT OF THE FORTY-THIRD NATIONAL CONFERENCE ON WEIGHTS AND MEASURES ¹

FIRST SESSION—MORNING OF TUESDAY, JUNE 10, 1958

(J. P. MCBRIDE, CHAIRMAN, PRESIDING)

The invocation was delivered and the memorial service for departed members was conducted by the Conference Chaplain, Mr. J. H. Meek, Director, Division of Markets, State of Virginia.

ADDRESS BY HON. SINCLAIR WEEKS, SECRETARY OF COMMERCE

It is a pleasure to be here today and to extend to you the greetings of the Department of Commerce. I congratulate the National Conference on Weights and Measures on having reached its 43d meeting, thus demonstrating that, while perhaps not yet middle-aged, it certainly has reached maturity.

This Conference, since its very beginning, has been an organization that has followed a pattern of discussion, cooperation and recommendation. The Federal Government does not dominate; it provides advice and service to help local officials to do their own job well.

All of you of course are familiar with the fact that, since its start, the Conference has been sponsored by the National Bureau of Standards. In its relationship with the agencies of the Federal Government, the Conference, made up principally of State, county, and city officials, has aimed steadily for joint effort and accomplishment.

In my opinion, this objective has been realized. The Conference has been an outstanding example of good Federal-State relationship in which contributions have been made by both sides and in connection with which the individual responsibilities of both sides have been recognized and respected. Let's keep it so.

You are aware that many problems of local enforcement officials could be better solved by additional research. Hence the more the National Bureau of Standards does in refining and extending its measurement programs, the more such knowledge can be used by officials of the States in their own duties.

It is the policy of the Commerce Department to strengthen the Bureau. I have recommended and the Congress is considering an increase in the Bureau's budget from \$9,428,000 in fiscal '58 to \$11,500,000 in fiscal '59. Also, we are completing plans for the construction of an entirely new plant to be established outside Washington—with ample space, new buildings and the best in modern equipment.

You and I are living in quite a different world from the one most of us were born into. The rapid development of science and technology has created, on the one hand, dangerous military and political problems and, on the other, limitless opportunities for the good of mankind.

¹ With the exception of formal papers and committee reports, the record of the 43d National Conference on Weights and Measures has been rearranged, consolidated, condensed, and, in some cases, comments have been eliminated wherever necessary to reduce it to essentials for future reference.

National attention is directed to the advances of the Communist bloc in science education and in the making of sputniks, intercontinental missiles and nuclear weapons. American public opinion is determined that our own private and public science shall be strengthened. The fact that the National Bureau of Standards—under the able direction of Dr. Astin—will expand its program is one assurance that we are trying to meet the needs of the ultramodern age.

Among the opportunities unfolding to this generation is the greater use of science and technology in economic progress. Scientific research has played an important role in creating new products, in increasing productivity and in other ways raising the standard of living.

Regardless of a slower economic pace right now compared with 1957, and of the necessary demands of national security, we must not water down research connected with the civilian economy. We must not rob tomorrow of its chance to grow strong. We must continue to encourage research, including basic research which is the fountainhead of future development.

The importance of science and technology to the economy is clearly revealed by the history of the National Conference on Weights and Measures. It is brought home to everyone who examines your record that your interests, your activities and your influence are so closely connected with the interests of the business community and with the national economy that your leadership and guidance contribute greatly to economic stability and growth.

Economic Situation

Because of your important role in the economy, I have been asked to give you a brief run-down on the current economic situation—both the headaches and the hopes.

For the last several weeks, business statistics in general have looked better than at any time since the decline started last year. The field day of the hand-wringing pessimist is about over.

If public confidence continues to grow, if business continues to spur the upturn, and if government continues to keep away from gumming the works by unsound legislation, the economy should continue to improve.

To get a better understanding of the prospect, let us first consider some major causes of the recession. A super-boom in capital investment created temporary overcapacity. Confidence waned last fall and buying shrunk. Inventories piled up above sales.

The Commerce Department announced in the press yesterday, a survey showing that businessmen expect to invest \$31 billion in new plant and equipment this year.

Admitted, this sum is below the \$35 billion spent in '56 and is 17 percent below the record outlay of \$37 billion in 1957. But don't underestimate this significant comparison: Except for these two all-time peak years, this year's total is higher than that for any other year.

As sales improve, business as always will step up its capital spending to improve its know-how and add to its facilities so as to produce the amount and kinds of goods the people want.

Excessive inventories, in relation to reduced demands, have caused layoffs in manufacturing, especially in autos and other consumer durables and in producers' durables.

Now the inventory picture looks a bit better. Many companies are scraping the bottom of the barrel. Stocks, on a seasonally adjusted basis, declined \$800 million in April.

This must mean that some companies are improving their inventory position. Thus, with sales strengthening somewhat, some firms have been buying again for inventory which means more production and more jobs. Steel mill operations advanced from a low of 47 percent of rated capacity in the last week of April to 61 percent in the first week in June.

Other signs of healthy revival are: Employment in May rising to 64.1 million, a jump of 1.2 million from April. The number of jobless dropped by 200,000 to 4.9 million. The seasonally adjusted unemployment rate declined from its high 7.5 percent in April to 7.2 percent, the *first* dip since the rate started to soar last summer.

Preliminary estimates reported last week by the Department indicate that new construction activity went up to \$4.1 billion in May, a 10 percent increase over April. Total dollar volume for the first 5 months at \$17.7 billion is about equal to that of the same period last year. Our Interstate Highway Program will be accelerated in the coming weeks and add its boost to the forward thrust of construction.

To sum up: The indications are that the convalescing economy still has some months to go before it recovers complete health. Because of plant overcapacity and inventory backlogs, the pace of revival may not be as fast as we should like.

But confidence in job security is strengthened by the knowledge of rising employment, and additionally because personal income is holding up so well. The ability to buy consumer durable goods is strengthened by this fact and by the ample reservoir of savings and credit.

Considering both the minus and the plus factors, the outlook is bright for better times later this year.

To me, optimism is another word for vision. When we examine closely our strong economic foundation and correct its lingering weaknesses and when we realize our nation's expanding science and its potential for spectacular economic growth in the next ten years, the evidence in support of realistic optimism is overwhelming.

Importance of Measurement

In conclusion: The importance to a growing, healthy economy of government's ability to control measurements is well known to every member of this Conference on Weights and Measures.

The value of this function is becoming better known to those whose selling and whose buying you affect. Whether in the case of the small grocer with one weighing scale or the great industry with literally thousands of devices for measurement, both processes and profits are controlled by measurement—and measurement is *your* business.

And, I repeat, *your* business helps *all* business.

In reading the program for this 5-day meeting, I am struck with the diversity of subject matter that is important to your jobs. I find topics that are legal, administrative, and technical—topics that—I am sure—would be of interest and importance to consumers, attorneys, technicians, administrators, and others.

I commend you and the people you serve on the great profession you have chosen—on your willingness to travel even great distances to participate in a technical conference—on your demonstrated interest in good government.

Here under a free political system and a free economic system, let us build a stronger and better America. Let us use science and industry with imagination and skill as partners in providing the economic strength that protects freedom and promotes peace and good will among all the peoples of this earth.

PRESENTATION OF HONOR AWARDS

Dr. Astin presented "Honor Awards" to 16 members of the Conference who, by attending the 42d Conference in 1957, reached one of the four attendance categories for which recognition is made—that is, attendance at 10, 15, 20, and 25 meetings. The presentation of these awards was authorized by the 40th National Conference and inaugurated in 1956 during the opening ceremonies of the 41st Conference.

HONOR AWARD RECIPIENTS

25-Year Certificates

None.

20-Year Certificates

C. L. Richard, E. C. Smith.

15-Year Certificates

H. H. Russell, A. C. Samenfink.

10-Year Certificates

K. W. Birkin, Sydney Black, J. E. Brenton, M. W. Craig, F. M. Greene, Erling Hansen, L. B. Macurdy, E. A. Reussenzehn, M. L. Rice, David Snyder, R. F. Straw, W. W. Wells.

ADDRESS OF THE CONFERENCE CHAIRMAN

By J. P. McBRIDE, *Director of Standards, State of Massachusetts*

The first annual meeting of the Sealers of Weights and Measures of the United States was held at the National Bureau of Standards, January 16 and 17, 1905. It is interesting to note that this meeting was called by Dr. S. W. Stratton, the then Director of the Bureau, and the purpose of the call as set forth in the invitation to the meeting, was "to bring about uniformity in the State laws referring to weights and measures, and also to effect a close cooperation between the State inspection services and the National Bureau of Standards."

This first meeting was attended by eleven delegates including Dr. Stratton, Director of the Bureau, and the then Chief of the Weights and Measures Division, Louis A. Fischer, and one delegate who was also an equipment manufacturer. The organization was perfected at the second annual meeting with the Director of the Bureau as the Chairman of the Conference and the Chief of the Weights and Measures Division as its Secretary. The pattern of the Conference was thus established and has been so maintained through the years. We have, therefore, an early recognition of Conference benefits, and we have for many years experienced the realization of this concept. The Conference now has a total attendance of approximately 500 persons made up of weights and measures officials of the State and local governments, affiliated Federal officials, and representatives of equipment manufacturers, industry, business, and consumers.

The backbone of the Conference is, of course, its membership, and the attitude of the members on the seriousness of the work. But no little credit must be extended to the Director of the National Bureau

of Standards and his staff, and particularly to the Office of Weights and Measures and the men heading that division for their unceasing work in behalf of the cause of weights and measures. In my own period of service, and therefore within my knowledge, these men are: Former Director and Director Emeritus of the Bureau, Dr. Lyman J. Briggs, Dr. E. U. Condon, and the present Director, Dr. A. V. Astin, all of whom have taken special interest in weights and measures; and in the Office of Weights and Measures, Fay Holbrook, Henry Bearce, Dr. Wilmer Souder, Ralph Smith, and presently, W. S. Bussey and his staff. We must also acknowledge the pioneers in the Conference movement, Dr. Stratton and Louis Fischer.

It is, of course, but natural that any group will encounter periods of difficulty, but to the credit of this Conference may it be said that it has always endeavored to conduct its affairs in a true spirit of democracy with full opportunity for discussion and research with proper concern for the consumer and industry. On occasions, differences have existed between industry and the weights and measures officials, but the problems have been worked out by cooperative action and mutual respect for each other with the public interest always in mind.

Weighing and measuring equipment and methods of marketing are in a constant state of progress, and this Conference is the best hope of meeting the different problems with a common approach. It is, of course, a voluntary organization and has progressed without too much formality of procedure from its inception. However, it has now reached large proportions and because of this and the complexity of the many problems confronting weights and measures officials, the weights and measures Advisory Committee to the Director of the National Bureau of Standards and the Executive Committee of the National Conference recommended that a committee be appointed by the President of the Conference to study its organization and procedure and to make appropriate recommendations in relation thereto. This Committee was appointed in August 1956 and filed its report in considerable detail, including a statement of proposed organization and procedure, at the 42d National Conference. This report and recommended organization and procedure was approved and adopted by the Conference and I would strongly recommend that you give it careful study. This statement of organization and procedure of the National Conference as so adopted has been published in brochure form and is available to you without cost through the Office of Weights and Measures. The statement outlines the objectives of the Conference, the relationship of the Conference to the National Bureau of Standards, and its membership, voting, and the functions of its officers and committees. I believe the objectives of the Conference bear repeating here, and they are as follows:

The objectives of the National Conference on Weights and Measures are (a) to provide a national forum for the discussion of all questions related to weights and measures administration as carried on by regulatory officers of the States, Commonwealths, Territories, and Possessions of the United States, their political subdivisions, and the District of Columbia; (b) to develop a consensus on model weights and measures laws and regulations, specifications and tolerances for commercially-used weighing and measuring devices, and testing, enforcement, and administrative procedures; (c) to encourage and promote uniformity of requirements and methods among weights and measures jurisdictions; and (d) to foster cooperation among weights and measures officers themselves and between them and all of the many manufacturing, industrial, business, and consumer interests affected by their official activities.

This present Conference is the first meeting under the new plan, and I deeply appreciate the honor of being its Chairman.

In conclusion, may I say that this is your Conference, and you should give it your every effort to continue the success which it has achieved by the contributions of the many good public servants in weights and measures who have freely given of their time and talents to it over the years. Unlike many government positions, the weights and measures official is generally a one-man authority without aid of associates who share the responsibility of decisions. You, therefore, need something to which you can turn to fortify your many decisions and this Conference in large measure will fill that need. Out of these Conferences has come your Weights and Measures Library consisting of:

NBS Handbook 26, Weights and Measures Administration
NBS Handbook 37, Testing of Weighing Equipment
NBS Handbook 45, Testing of Measuring Equipment
NBS Handbook 44—2d Edition, Specifications, Tolerances, and Regulations
for Commercial Weighing and Measuring Devices
NBS Circular 501, Federal and State Weights and Measures Laws
NBS Circular 540, Weights and Measures Case Reference Book
Annual Conference Reports and Periodical Circulars and Pamphlets issued
from time to time

ADDRESS OF THE CONFERENCE PRESIDENT AND APPOINTMENTS TO STANDING COMMITTEES

By A. V. ASTIN, *Director, National Bureau of Standards*

I am very pleased with this annual opportunity to talk to the representatives of the States and industries concerned with weights and measures activities.

As your Chairman has pointed out, this is the first Conference conducted under the recently formalized organization and procedures of the National Conference.

Basic to the functioning of the National Conference on Weights and Measures is its relationship to the National Bureau of Standards. This relationship stems from our enabling legislation which authorizes cooperation with the States in securing uniformity in weights and measures laws and methods of inspection. It is our desire to implement to the maximum extent the authorization given in our statute. We receive from this Conference many suggestions as to what the problems are confronting weights and measures officials, and it is our desire to work on those problems where our technical competence might be of assistance.

The formalization of the procedures of the Conference changes in no way the basic sponsorship by the Bureau of this Conference. It is our desire to continue the close affiliation, under this new formalized arrangement, which has existed between the Bureau and the Conference for more than 50 years. It is anticipated that the close ties that have prevailed in the past will continue, and that we will extend during the coming years into new areas the cooperation between our staff and the weights and measures officials.

Now, if the National Conference on Weights and Measures is to realize its maximum potential and if its decisions are to have an impact on our particular areas of interest, I believe there are three basic factors which must be operating.

The first is that of active participation on the part of the delegate. Attendance throughout the scheduled sessions of the meetings is most important. Close attention to the proceedings, in combination with prior study of committee reports and other material available in advance of business sessions, is a prerequisite to constructive debate and intelligent voting on matters at issue.

The second factor is that of genuine cooperation; areas of difference must be explored openly. They must be examined in the light of mutual needs directed by technical data. Negotiations must also be entered into in good faith. Facts examined in a cooperative spirit will tend always to an optimum solution of a mutual problem.

Third, I would recommend positive acceptance, when this does not violate the sovereignty, of those decisions and recommendations which represent a formal act of this organization. If, by its action, the National Conference can only achieve lip service to its decisions, it makes no contribution to uniformity, which is a basic objective of this Conference.

Before concluding this discussion of organizational responsibility, I would like to add the thought that, whatever the responsibilities of the individual, these are magnified in the case of the officers and the committee chairmen and the committee members of the organizations. These persons are, by reason of their offices, the leaders of the organization.

I should now like to mention one important problem that has come to my attention during recent months which I believe deserves further consideration by the National Conference. In 1941, and in 1955, the National Conference made recommendations for the resolution of problems involved in ascertaining weights of products where moisture content changes are involved. Specifically, the problem brought to the attention of the National Bureau of Standards related to the packaging of flour. Since this is a problem which has already received the attention of the Conference—I understand it was considered further by the Executive Committee yesterday—I am recommending that the Conference restudy this situation specifically with respect to the still unsolved problem of flour packaging, and more generally with respect to all problems where a change in moisture content is of importance.

The objective of this study should be that of achieving a uniformity of weights and measures procedures based on reliable measurement. I believe part of the confusion that now exists in the flour packaging problem and in other areas where moisture content is important is the lack of adequate measurement techniques and instrumentation for establishing uniform methods of test. Most of the uncertainties and disagreements that arise in such cases come because of guesses or estimates made as to actual moisture content or changes in moisture content. This condition, I am sure, will continue to exist until we quit guessing about moisture content and actually measure moisture content. The National Bureau of Standards would be happy to provide technical assistance in resolving the measurement aspects of this problem if it is the desire of the Conference.

I believe it would be useful to establish a committee of this Conference to take this problem under advisement and to have the work of this committee associated closely with the interest of the Association of Food and Drug Officials of the United States, since this association is very much concerned with the moisture loss problem. In addition,

I think that we should have the cooperation of industrial organizations in order to have a wide range of interest to bring about a proper solution.

I wish now to report the publication of a new Bureau circular prepared in our Office of Weights and Measures. It is NBS Circular 593, entitled "The Federal Basis for Weights and Measures." The scope of the publication is indicated by its subtitle, "A historical review of Federal legislative effort, statutes, and administrative action in the field of weights and measures in the United States." There is presented, very largely in chronological form, a connected and reasonably comprehensive story of the Federal contribution to the legislative basis for weights and measures administration in the United States that is of interest not only to the general reader, but that should provide very valuable source material for weights and measures officials and students of government. It is anticipated that Circular 593 will find widespread use by schools and weights and measures departments. It will receive the normal distribution in our mailing list and will be available for purchase from the Superintendent of Documents at 30 cents a copy.

The Office of Weights and Measures also has had printed an extract from an extensive report on weights and measures made to the Congress by John Quincy Adams in 1821, when he was Secretary of State. Adams' statement of the universality of weights and measures is indeed a classic, and one to which all of us can still subscribe. Copies of the print are available to all of you who may wish to have it framed for use in connection with exhibits or other public activities.

We have completed and will distribute shortly to interested parties a second supplement to Handbook 45. This is a testing guide for weights and measures officials and is best explained by its title, "Testing Liquefied Petroleum Gas Liquid-Measuring Devices."

In the form of a draft for comment, a procedural guide covering the checking of prepackaged commodities has been sent out, and many helpful suggestions have been received. As time permits, the paper will be revised in the light of these suggestions and then will be issued as a publication of the National Bureau of Standards.

The complete revision of Handbook 26, "Weights and Measures Administration," is well under way. This handbook has been out of print for some time, but the demand still continues. We hope to have the manuscript in the hands of the printer within a month or two, and we anticipate the issuance of the publication before this Conference meets again.

The 40th Conference on Weights and Measures in 1955 adopted a resolution requesting the Congress of the United States to direct the National Bureau of Standards to provide each State and Territory with a modern set of weights and measures standards, with the necessary instruments and accessories. Since that time, the National Bureau of Standards has been studying this subject to develop some definite ideas about such a project. During the past 15 months, Dr. Lewis F. Judson, Chief of our Length Section, has made three trips to study the requirements for standards at State offices of weights and measures. The first trip was to the Northeast section of the country, the second to the Ohio Valley, and the third to the Southeast. This summer he will travel to the West Coast, stopping at several State Capitols on the way and at others on the return trip.

Definite decisions about specific standards will not be made until after Dr. Judson returns from his western trip, at which time we should have a sound basis for deciding what standards and equipment should be supplied by the Federal Government and if a recommendation to that effect is to be made by the Bureau.

In any event, we then will proceed to prepare specifications for the standards, to have sample standards fabricated, and to test these thoroughly. This we must do as part of our advisory service to the States, whether or not the distribution of standards is to be pursued.

Under the organization and procedure of the National Conference on Weights and Measures as adopted in 1957, it is my duty to make appointments to fill vacancies that occur in the Conference standing committees. Each appointment this year is for a full term of five years.

To the Committee on Education, to succeed Mr. C. A. Lyon of New Hampshire, I appoint Mr. J. Fred True of Kansas.

To the Committee on Laws and Regulations I appoint Mr. E. L. Randall of Nevada. The terms of both Mr. Nalls Berryman of Florida and Mr. E. C. Westwood of Salt Lake City, Utah, are expiring, but only one vacancy is created. This committee, as you will recall, was formed several years ago by combining the Committees on Methods of Sale of Commodities and Trading by Weight, and is just now reaching the standard size of five members.

To the Committee on Specifications and Tolerances I appoint Mr. V. D. Campbell of Ohio to succeed Mr. H. E. Howard of Miami, Florida.

Now there is a fourth committee, the Weights and Measures Advisory Committee to the National Bureau of Standards. This also has been reorganized during the past year and is now a committee of the National Bureau of Standards, chaired by Dr. McPherson. It consists of experts of both government and industry in the weights and measures field who are appointed by me. I have recommendations from the Conference Chairman, supported by the Executive Committee, and these, of course, are always appreciated. The recommendations for the two vacancies on this committee are that I appoint the Honorable Parke C. Brinkley, Commissioner, State Department of Agriculture and Immigration, Richmond, Virginia, and Mr. L. T. Gustafson, General Sales Engineer, The Creamery Package Manufacturing Company, Chicago, Illinois. I, therefore, name these two gentlemen to the Advisory Committee of the National Bureau of Standards.

I am sure the Conference will want to give the retiring members a big hand for appreciation of their outstanding service to the Conference and the Bureau.

Now, before closing, I would like to follow a custom I have employed on prior occasions to report briefly on some of the activities of the National Bureau of Standards outside of the activities of its Office of Weights and Measures.

Most important among these are the prospects for a substantial increase in our budget that was referred to by Mr. Weeks and the prospect for proceeding on our relocation to Gaithersburg. On the latter, the President just yesterday submitted as part of a supplemental budget to the Congress estimates that will permit us to proceed on the detailed design of our hoped-for new facilities at Gaithersburg.

In our technical program, we have been giving considerable attention in the past year to improving our capacity for calibrating measuring instruments. We have found that in many areas of science and engineering our ability to provide accurate standards has not kept pace with advances in the various specialties.

I have called to your attention before the problem with respect to length measurement. Acting under the urging of some parts of our machine tool industry, we have been pursuing a program aimed at extending our competence for precise length standards, specifically gage blocks that will be stable and capable of being certified to an accuracy of a few ten-millionths of an inch. Progress on this is going quite satisfactorily, although it looks like it is going to be a long pull before we achieve the final objective.

In addition, we are working vigorously in securing competent data to enable us to convert to a wavelength standard for length measurement, which is expected to take place in 1960.

In the electrical measurement field we have made a number of improvements in our ability for precise measurements; particularly, we have devised a new standard for electrical capacity measurement, and are thus in a much better position to meet the needs of our electronic and electrical industry.

In addition, we have brought into being, or nearly into being, a major electronic calibration center at Boulder, Colorado, where we will be able to do a much better job on the calibration of electronic and high radio frequency instruments than we have in the past. The Congress provided the funds for the erection of a wing to our laboratories in Boulder; that building was completed just last year. It is now being equipped, and we plan to hold a formal dedication program for this new calibration center in Boulder this coming August.

We have given a great deal of attention to the field of temperature measurement and temperature standards. We have extended the precision of our own measurement capability appreciably, up to $2,000^{\circ}\text{C}$, but we are much concerned over our capability at higher temperatures. We are giving this problem a great deal of attention at the Bureau now. Fortunately, the appropriation which we expect to receive from the Congress next year will carry a provision for an accelerated program on high temperature measurement and properties of materials.

One of the most interesting activities we have had at the Bureau this past year, I believe, is our participation in the International Geophysical Year. As you know, for a number of years we have operated a Central Radio Propagation Laboratory that makes weather-type observations on the electrical properties of the high upper atmosphere and analyzes data on the upper atmosphere and distributes these analyses to the communications industries. A great deal of the concern of the International Geophysical Year has been with the ionosphere—that part of the upper atmosphere that makes possible long-range radio communication. We have played a major part in intensive studies of the ionosphere, manning several stations even in Antarctica and additional stations in South America. These are over and above the approximately 20 stations around the Western Hemisphere that we have normally maintained. Furthermore, we were given responsibility during the IGY of running a program called “The World Warning System.” Here the interest is in stepping

up the intensity of observations of observers all over the world during periods when there is unusual solar activity. We, of course, have, through our own laboratories and through private laboratories under contract, a monitoring observation system of the sun, in order that we can follow its behavior in relationship to radio propagation characteristics. Building upon this particular capability, we are now studying the sun's activity and making predictions as to when something exciting or unusual is apt to occur and then setting up a special "world day" or "world interval" in alerting the observing scientists in the sixty-odd nations that are participating in the IGY to step up their observations.

The center of this world warning service is at nearby Fort Belvoir, Virginia, and it has had a most exciting time since the IGY started last July, because the sun has been most cooperative in turning up many unusual storms and thus providing an unusual opportunity for the observations that the scientists are concerned with making.

Finally, I would like to comment on an administrative procedural change that we have made in the National Bureau of Standards during the past year. You may recall that about four years ago we set up a series of advisory committees to help us relate our program more specifically to the pertinent needs of science and industry. It was in connection with this that we established our Weights and Measures Advisory Committee. We also called on the leading scientific and engineering societies to nominate representatives to provide advisory service to us on our program. This whole program has been turned over during the past year to the National Academy of Sciences, and we will now look to that organization for advice and assistance in our program planning.

The National Academy of Sciences, you may recall, was established in 1863 specifically to give scientific advisory service to the Government. It seemed quite natural that we should turn to this organization for securing this advisory service. There were some exceptions made in this change, and we excluded from this group the advisory services on weights and measures activity because it was felt that that was more closely associated with the interest of this Conference than with the National Academy of Sciences. Therefore, we are continuing that advisory committee as a committee of the Bureau, but with the members recommended to us by our own Chairman and Executive Committee.

Finally, I would like to urge that any of you who are interested in specific problems or activities at the National Bureau of Standards tell us about them, and do visit us. We are always eager to do those things that will be most important to the people we serve; and among the people we serve in the National Bureau of Standards, none are of greater significance than the members of the National Conference on Weights and Measures.

SOME ASPECTS ON LEGAL METROLOGY IN GERMANY

By W. MÜHE, *Physikalisch-Technische Bundesanstalt,
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In many countries the separation of the responsibility of the government from those of the private citizen is continually discussed, often with the aim of increasing the responsibility of the citizens. In metrology, however, it is recognized now in most parts of the world

that it is the government's duty to make it possible for its industry, its national services, its technology, and even each of its citizens, exactly to measure and to calibrate anything suitable to physical measurement.

Accurate and uniform measurements and calibrations can only be carried out if the physical and technical units are well defined, maintained, and developed according to the latest advance of science and technology. There must be a technical and physical agency for accurate measurements, for advisory service in the field of physics and technology, and even for the solution of physical and technical problems, such an agency responsible only to the physical truth and not to any commercial interest. The organization of such a body in Germany about 70 years ago seems to me to be the establishment of this first main principle of Germany's legal metrology. This may be called the principle of the State's patronage at all measurements.

The basic units of mechanics, electricity, and thermodynamics are legally defined in three laws, these are "Gesetz, betreffend die elektrischen Masseinheiten" of 1898, the "Gesetz über die Temperaturskale und die Wärmeeinheit" of 1924, and the "Mass und Gewichtsgesetz" of 1935. The laws prescribe, among other things, that in the fields of legal metrology only the legal units may be used.

While the State is responsible for exact measurement, it demands exactitude and official testing for certain measuring apparatus and certain applications. Without restricting the economy and the citizen's freedom more than necessary, metrology must be legally regulated with respect to a particular need for protection of the population, e.g., against imposition in trade and commerce or against damages of health. This is surely the second main principle of Germany's legal metrology. Being perhaps a little more broad than the "weights and measures" term used in the United States, it deals with all instruments "for public use to determine the extension of a transaction," as the German law calls it. This concerns, for instance, gas and electricity meters, instrument transformers, balances, taximeters, and volume measuring devices. These are instruments whose indication fixes the price for a commercial ware. Also, some measuring instruments for medical tests, for legal purposes of the fiscal office, and for traffic supervision, also certain reference and working standards of other governmental agencies and of industry are under obligation for testing and certifying.

All these instruments must only be tested if they are used for a purpose specified in the German laws and regulations. There exists generally no regulation that a commercial ware must be sold or bought by weight or by measure. Responsible for the punctual submission to an official test is the user of the instrument. There are only two exceptions from this principle in West Germany. All produced medical thermometers and butyrometers must be tested legally, these instruments may not be used in trade without the official stamp.

In a wider sense of the term "legal metrology" the activities of type approval and testing of explosion-proof electrical equipment belong to this field. According to the German regulations, the electrical apparatus used in spaces liable to contain explosive mixtures must be approved. Similar duties of serving the public safety arise from the testing of sporting weapons and of civilian shooting installations such as ballistic tools for industrial purposes. Also, the type

approvals of some roentgen ray installations legally demanded in Germany are part of this metrological activity.

The third main principle of Germany's metrology status seems to me to be the close connection of all metrology work with the development of science and technology. So Germany's central institutes of legal metrology have tried since the last century to be also germ cells of scientific research and technological progress.

One of the sponsors of the central German State laboratory, the pioneer of technical development Werner von Siemens, formulated this principle very clearly more than 70 years ago. In a report of 1883 concerning the foundation of this laboratory he said:

Scientific research always is the solid base of technical progress, and a country's industry will never gain and maintain an international, leading position, if the country does not stand at the same time on the top of a scientific progress. Gaining this is the best way for raising the industry.

The Physikalisch-Technische Bundesanstalt (PTB)

Up to 1945 the Physikalisch-Technische Reichsanstalt (PTR)—that means the Physical Technical National Institute—was Germany's State laboratory and paramount authority in the field of metrology. This institute was founded in 1887 under the direction of Hermann von Helmholtz at Berlin-Charlottenburg. Its successor with respect to the territory of West Germany is the Physikalisch-Technische Bundesanstalt (PTB) at Braunschweig with its important Berlin Institute at the place of the old installations. As for the Eastern parts of Germany, there was established, also in Berlin, the Deutsches Amt für Mass und Gewicht (DAMG)—which means the "German Bureau of Weights and Measures." I shall restrict my talk to the situation in West Germany.

The staff of the Bundesanstalt at Braunschweig and Berlin numbers about 1,000 employees. There are 6 scientific divisions at Braunschweig, these being Mechanics, Electricity, Heat, Optics, Acoustics, and Atomic Physics, some of them divided into subdivisions. The Berlin Institute consists of two sections. The organization of the Bundesanstalt also includes some special offices and services, such as an Office on Legal Metrology, the Administration, a Central Workshop, the Library, and a Technical Service and Supply.

Some functions of the Physikalisch-Technische Bundesanstalt are quite similar to those of the National Bureau of Standards. The German Institute is responsible for the creation, maintenance, and development of fundamental measurement standards and checks the accuracy of derived standards. This not only includes the International Standards of length, mass, time, electrical current, temperature scale, and light intensity, but also many derived standards, such as standards for pressure and force measurements, frequency standards, electric cells and resistances, acoustical and radiological standards. This involves the entire field of physics, and the experimental resources for such work are extensive.

The PTB is also charged with the advisory service to other governmental authorities, to commerce, industry, and to private persons on scientific and technical problems, especially if the problem can be solved by measuring.

Another duty of the Institute is the testing of instruments with respect to their function and accuracy and of materials with respect to their electrical, optical, acoustical, and radiological properties.

"Research on command," as to the requirements of industry—a very actual matter nowadays—also can be carried out in case such research fits into the frame and field of interest of the Bundesanstalt.

An important public duty is the cooperation with associations and technical organizations and the participation in the international organizations of these bodies. The scientists of the German State Institute also attend to the international interests of the German Republic in some international organizations such as the International Conference on Weights and Measures or the institutions of the International Organization of Legal Metrology. Of course, there are close relations with many corresponding national institutes such as the National Bureau of Standards.

Most interesting for this assembly will be the activities of the German Institute as the supreme technical authority on legal metrology. These tasks are specifically defined in the German laws on weights and measures and in supplementary regulations. Some of these duties are:

- Preparing recommendations for laws and regulations concerning weights and measures.

- Publishing technical regulations about the construction and characteristics of measures and measuring instruments.

- Issuing instructions about the procedure for testing and stamping of measures and measuring instruments.

- Type-approval and licensing of certain measuring devices for testing, and legal certification of the single instrument.

- Gaging and certifying standards for the metrology boards and industry.

- Testing and certificating of certain classes of measuring instruments which PTB has reserved for itself.

At least once a year the directors and chiefs of laboratories of PTB who have activities in the field of legal metrology and the heads of the German State Metrology Boards come together in the so-called "plenary-meeting of PTB" (Vollversammlung der PTB). During this meeting they discuss verification regulations and adapt them to the newest measurement and commercial techniques. The representatives of PTB report on the scientific developments, and the representatives of the Metrology Boards discuss their experiences in the practical testing activities. This meeting is conducted by the President of PTB.

The Metrology Boards and the Electrical Testing Bureaus

The practical work of testing and certificating most of the measuring devices is carried out by State institutions called Metrology Boards (Eichdirektionen). At present there are 11 Metrology Boards in West Germany located at Berlin, Bremen, Darmstadt, Dortmund, Hamburg, Hannover, Kiel, Köln, Bad Kreuznach, München, and Stuttgart.

The Metrology Boards supervise the Local Metrology Offices. It is their function to guarantee precision of respective standards and testing apparatus and the correct application of these throughout their respective districts. In certain cases the Metrology Boards can also reserve and concentrate activities of the Metrology Offices to themselves. Otherwise, the legal tests, legal certifications, and special tests (Eichungen, eichamtliche Beglaubigungen und Sonderprüfungen) are executed by the local Metrology Offices (Eichämter), of which there now are more than 130 in West Germany. In addition there is generally also assigned to these offices technical supervision

of factories producing retail containers and bottles not being under obligation for testing. They also supervise the public weighing officials and weighing services (öffentliche Wäger und Wägebetriebe).

The responsibility of the Metrology Offices may be limited to special branches of testing of industrial measuring instruments in its district. There are, for example, several Metrology Offices engaged only in the testing of glass-measuring apparatus.

The work of the officials is carried out either at the office or at the place where the measuring instruments are produced, repaired, or used. The re-testing of measuring apparatus which is under obligation of two year's re-testing—and that is mostly the case—takes place on certain days which are fixed locally. For this purpose the Offices work out round-trip plans every year. According to the law on weights and measures, the district authorities have to arrange for suitable rooms and to inform the owners of instruments which shall be tested and to provide assistants if required.

The regulation for measuring instruments in electricity differs in some points. Mostly these measuring instruments are tested by Electrical Testing Bureaus (Elektrische Prüfmäßer), of which there are about 60 and about 200 external bureaus. In this case it is, according to the law concerning the electrical units, the duty of PTB to provide immediately the standards and to supervise the measuring devices and measuring apparatus. As to the electrical measuring instruments, PTB has also to establish a uniform legal test and certification throughout the Federal Republic. According to a new administrative agreement between the Federal Republic and the individual States, the Metrology Boards are supervising the technical activities of these Bureaus.

The Education and Training of the Staff

The staff positions of the Metrology Services are divided into four groups: superior service (höherer Dienst), high (elevated) service (gehobener Dienst), means service (mittlerer Dienst), and ordinary service (einfacher Dienst). The first group includes scientists and civil engineers who have studied at universities and technical colleges; they represent the directors of the Metrology Boards and a few specialists generally working at the Boards. To the second group belong technical specialists with engineer training, to the third technical specialists who have passed the examination as masterworkman, both groups forming the main staff of the Metrology Services. The fourth group must have passed the examination as specialized workers before entering the Service.

For further instruction and training of the personnel, the Metrology Boards are responsible. After a fundamental training of 18 months all candidates are sent to the Metrology School at the State's Bureau of Weights and Measures in München (Munich) in order to pass an instruction course of three months and an examination. These instruction courses and examinations take place on two grades, one for the "high service" and the other for the "mean service."

At present there are some difficulties in Germany in the engagement and instruction of the staff. Qualified technicians are very rare. Moreover, new problems arise with the entrance of electronics, even in the field of classical metrology. The correct testing of a complicated weighing machine is often not an easy task, especially if the apparatus is still under trial. Similar difficulties arise from other

new developments of metrology including new instruments, such as electronic humidity meters for grain and floating roofs on storage tanks. So there is some effort at all German Metrology Boards to form and instruct more technical specialists.

Participation in the International Organization of Legal Metrology

There are so many international organizations already active in the fields of physics and technology and even metrology, that sometimes it seems to be confusing. But without doubt there was until now a serious deficiency in the sphere of legal metrology. Here too, the narrow national interest should be widened to lead a practical cooperation of nations.

There is no reason why, for example, a water meter tested and permitted for use in one country should fall under other regulations in another country. These perhaps differ only a little and do not contribute essentially to the instrument's quality or function. Such differing regulations only cause minor technical changes, thus making it more expensive and rendering more difficulty in the international exchange. Of course, there are demands which must be different in some countries; let us think, say, climatic condition such as temperature or humidity. Tradition, taste, and local customs too, must be considered, but nevertheless there are many technical aspects which could be identical for all countries even in spite of the existence of different systems of units.

There was the question if some other international body, for instance a standards organization, would not be able and ready to carry out this work. But in most countries the technical standards have a more private character, and the regulations of legal metrology can only be ruled and regulated by a governmental organization.

In 1937 a first International Conference, with the representation of 37 countries, was held with respect to the eventual creation of an International Organization of Legal Metrology. The war interrupted the preparations and the temporary Committee instituted by the Conference could not resume and continue its activities until 1950.

An International Convention was prepared and is as of now signed by the representatives of 26 countries. These are:

Austria, Belgium, Bulgaria, Cuba, Czechoslovakia, Denmark, Dominican Republic, Finland, France, Germany, Holland, Hungaria, India, Iran, Italy, Marocco, Monaco, Norway, Poland, Rumania, Spain, Sweden, Switzerland, Tunisia, U. R. S. S., and Yugoslavia.

The countries Greece, Jordan, Luxemburg, and the United Kingdom wished to be at present only corresponding members.

In 1956 the first General Conference of Legal Metrology was held and the whole of Germany was represented there by a single delegation with President Vieweg as its head. About 40 working groups were constituted and several of them already have begun their work, although the Convention only got its legal validity a few days before today. It was stipulated in the Convention that the moment of validity should be 30 days after the ratification by the 16th country, and this was obtained on the 28th of May by Finland's ratification. Now the Convention is ratified by 17 countries and several other ones are expected to do this during the next month.

There is already founded an International Bureau of Legal Metrology in Paris. This Bureau is not engaged in laboratory work like

the International Bureau of Weights and Measures, in which experimental work to develop the physical units and to establish primary standards is carried out. The Metrology Bureau is doing organization work and is looking after efficient liaison among all contracting countries.

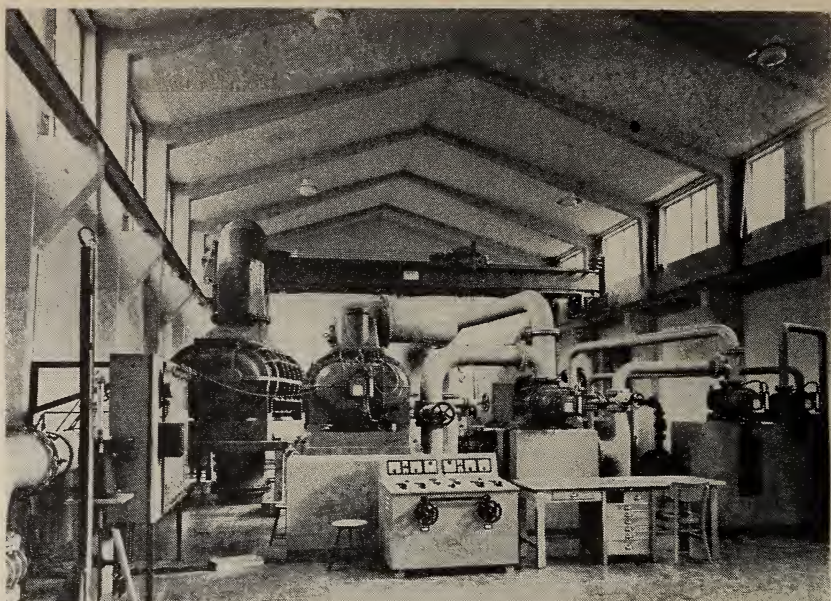
The necessary experimental work is distributed among the countries having their own laboratories and dealing with the field in question. Germany as a whole participates in 31 of the established working groups. The practical work is distributed among the German central institutes PTB and DAMG. Germany accepted also the responsibility of being the secretary of several working groups such as approval of types and systems of measuring devices, electronic weighing apparatus, measuring systems to determine the quality of grain, industrial gas meters, instrument transformers, clinical thermometers, and taximeters.

It is the final object of the organization to enable the mutual acceptance of the type approvals and perhaps of the verification of single instruments. Surely those countries which cooperate in these activities will take advantage from the expected facilities. The way will be long, without doubt, to obtain the final result, but some other profit will be gained earlier or may already be attained. Interchange of experiences in testing and approval of instruments, exchange of regulations and specifications, and documentation of legal metrology work undertaken by the working groups will be profitable and, it is to be hoped, the organization will lead to further international cooperation in science, technology, and economics.

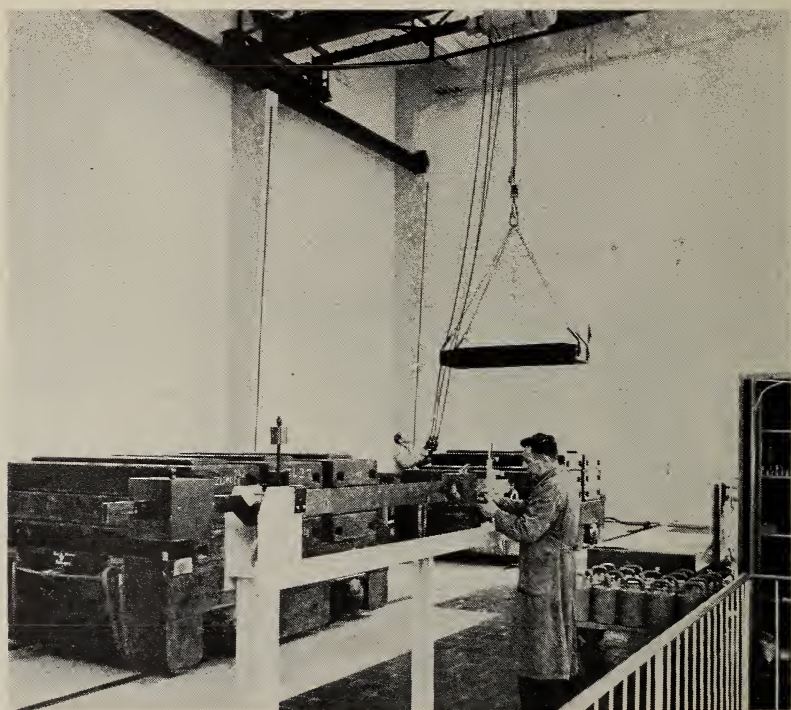
(Dr. Mühe illustrated his talk with appropriate slides.)



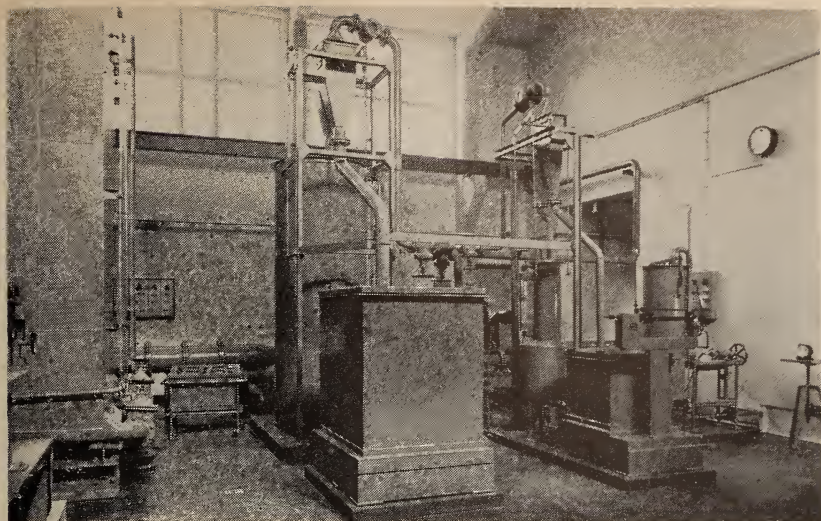
60 meter comparator room in which are tested measuring tapes and line standards using optical and photoelectrical methods. Smaller comparators of this kind are installed in the State Metrology Boards and in some Metrology Offices.



Gas and liquid meters used commercially are required by German law to be officially tested. In this station standard gas meters are calibrated for the State Metrology Boards and for industry.



100-ton track scale and standard load car. Similar cars are used by the State Metrology Boards to test and license the track scales of the German railway system.



Installation to test water meters up to a flow of 25 cubic meters per minute by weighing or gaging the quantity of flow.



Volumetric test vehicle with two test measures of high accuracy for 1000 liters and 5000 liters built by the Schwelmer Eisenwerk for PTB. Similar test measures are used by the State Metrology Boards to test tanks, pumps, and volumetric meters.



Test vehicle of the Metrology Board of Berlin used as a standard load for testing road and vehicle scales.



Official test of clinical thermometers by a Metrology Office.

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 10, 1958

(H. J. McDADE, Vice Chairman, Presiding)

REPORT OF THE COMMITTEE ON EDUCATION, PRESENTED BY W. A. KERLIN, CHAIRMAN

The report of your Committee on Education deals with several subjects of interest and concern to every weights and measures official. During the past year the Committee has been active on a number of projects, and immediately preceding the Conference the Committee held an open hearing during which it solicited the views of all at interest.

One project, a joint venture of the Scale Manufacturers Association and the Committee, was completed. This involved the preparation and distribution of a typical talk to be given by a weights and measures official before civic groups, and the like, and copies are available from the office of Mr. Arthur Sanders, Executive Secretary, Scale Manufacturers Association, One Thomas Circle, Washington, D. C. The paper is so designed as to facilitate the inclusion of local statistics merely through the filling in of blanks.

A second project, and the major one undertaken this year, was the collection of salary information on a nationwide basis, in order to recommend to the Conference salary schedules that represent prevailing rates for professional personnel. The first study in this area was made by the Committee on Education during 1952 and the first recommendations on salary schedules were made to the 37th National Conference. Revisions were recommended to the 39th National Conference. In its study this year, the Committee once again considered all factors that in its opinion would assist in the justification of the recommended salaries before such governmental officials as budget analysts and executive administrators.

The Committee recommends the following schedule:

	Departments (20 or more employees)				
Chart 1, Personnel	Monthly 5-step rates				
	1	2	3	4	5
Trainees.....	\$356	\$375	\$394	\$414	\$436
Deputies.....	436	459	484	509	536
Chief Deputy.....	*626	660	696	734	775
Chief Deputy.....	*696	734	775	816	861
Department Head.....	*775	816	861	909	959
Department Head.....	*909	959	1011	1068	1126
*According to size of department.					
If a "Three-Step Plan" is used, take the amounts shown under 1, 3, and 5.					
Some large departments may also have other classifications such as "Junior Deputies," "Senior Deputies," "Senior Complaint Deputies," "Investigators," etc. Salaries for these classifications can be established in accord with the above.					

Chart 2, Personnel	Departments (10 to 19 employees)				
	Monthly 5-step rates				
	1	2	3	4	5
Trainees-----	\$356	\$375	\$394	\$414	\$436
Deputies-----	436	459	484	509	536
Chief Deputy-----	*509	536	565	595	626
Chief Deputy-----	*626	660	696	734	775
Department Head-----	*696	734	775	816	861
Department Head-----	*775	816	861	909	959
*According to size of department.					

Chart 3, Personnel	Departments (6 to 9 employees)				
	Monthly 5-step rates				
	1	2	3	4	5
Deputies-----	\$436	\$459	\$484	\$509	\$536
Chief Deputy-----	509	536	565	595	626
Department Head-----	696	734	775	816	861

Chart 4, Personnel	Departments (2 to 5 employees)				
	Monthly 5-step rates				
	1	2	3	4	5
Deputies-----	\$436	\$459	\$484	\$509	\$536
Department Head-----	536	565	595	626	660

Chart 5, Personnel	Departments (1 man)				
	Monthly 5-step rates				
	1	2	3	4	5
Sealer or Inspector-----	*\$436	\$459	\$484	\$509	\$536
Sealer or Inspector-----	*509	536	565	595	626
*According to size of jurisdiction.					

Other items before the Committee during the past year were:

1. The cooperative program between the Committee and associations of industry in the preparation of public relations and public information material. The Committee solicits the counsel, advice, and assistance of all interested organizations in this area and suggests that this matter probably can be handled directly between such organizations and weights and measures officials more effectively than if detoured through this Committee.

2. Weights and Measures Week.—The Committee recommends the official recognition by the National Conference on Weights and Measures of an annual Weights and Measures Week and the endorsement of this effort to bring to the attention of all the people the importance and value of weights and measures administration.

3. The Chicago System of Consumer Education.—The Committee endorses the plan to be presented by Mr. I. M. Levy, City Sealer, City of Chicago, known locally as the "Betty Budget Series." The Committee recommends that weights and measures officials avail themselves of the offer of the City of Chicago to make available at cost appropriate newspaper mats for this series.

4. Self-Education for Weights and Measures Officials.—Because of the limitation of time and the broad extent of this subject, the Committee has not concluded its study. This item will be retained on the Committee's agenda.

5. Training Schools for Weights and Measures Officials.—To be retained on the Committee's agenda for further study.

6. The Motion Picture "Assignment—Weights and Measures."—The Committee has explored at some length the public information value and utilization of the motion picture "Assignment—Weights and Measures." All evidence indicates that this film offers rather tremendous opportunities to every official to publicize his program and to inform the public on weights and measures service. The Committee urges that each official study his local situation and proceed to inaugurate a designed program involving the use of the motion picture and complementing personnel.

The Committee is appreciative of the cooperation of officials and representatives of industry in its field of effort. It earnestly solicits suggestions as to projects in which it can serve the National Conference on Weights and Measures and, through it, all weights and measures officials.

I wish now to introduce Mr. I. M. Levy of Chicago who will present as the next section of the Committee Report, a description of a special consumer-education project. This will be followed by the final section of the report, dealing with "Weights and Measures Week," which will be presented by Mr. Arthur Sanders of the Scale Manufacturers Association.

THE CHICAGO PLAN FOR CONSUMER EDUCATION

By I. M. LEVY, *City Sealer of Weights and Measures, Chicago, Illinois*

I am sure that many of you will share with me the memory of a famous Norman Rockwell painting, a long time favorite of weights and measures men. I can but inadequately give you a word picture of it but I will try. The scene is an old-fashioned butcher shop. The butcher and a sweet old lady are standing near a hanging scale on which some meat is being weighed. While the butcher is pressing downward on the pan of the scale, the dear old lady is using a finger on the underside of the scale to force the pan upward, both with expressions of beatified innocence are looking intently at the face of the scale—humorous, a bit exaggerated, nostalgic of an era now passed. The hanging scale is now practically in limbo and stories of the butcher's thumb are as up-to-date as a whip socket in a 1958 automobile.

Strange as it may seem, the modern American woman, who is both alert and knowledgeable, has not kept up with the "shopping facts

of life" quantitywise in the present day food mart. Perhaps the computing scale, which gives instant information to the merchant, both as to weight and money, has far out-paced her ability to check her purchases. Again, it may be the multitudinous variety of prepared, semi-prepared, frozen foods, etc., presented to her in glamorous attention-compelling packages which absorb her interest to such an extent that she is lulled into a lethargy of carelessness in her shopping methods.

In Chicago our department has concluded that no matter how diligent we may be in testing scales and measuring devices, or how widespread may be our coverage of commodity checking, or ordinance enforcement, unless the woman shopper is alert to her own interest and has a knowledge of good shopping procedures, there will still remain an unabridged gap between our efforts and our objective—"that the consumer get her money's worth."

The Chicago Plan in essence is this: We accumulated, systemized, and offered to the Chicago homemakers the experiences and shopping "know-how" of our inspectors and professional shoppers. We also included the experiences of other weights and measures departments.

In order to present this information to the consumer in the most acceptable form, we created a little cartoon character whom we named "Betty Budget," and "Betty" over the years through various media has been giving sound shopping advice to Chicago homemakers.

We never lecture the homemaker upon her shortcomings, for that would be presumptuous and it would probably be ineffectual. To make these messages even more palatable, we always precede our text with a light four-line jingle, which in itself is the core of the message. Each message is a single money-saving idea, some obvious and ordinary, some new and surprising. The program is an ever evolving one, because food merchandising is constantly progressing, and new quantity problems are created with it, so we try our very best to keep abreast of the times.

I will briefly outline the media we use.

1. We have produced a series of messages in mat form for newspaper use. At present there are 26 mats. It is our policy to discard such messages or mats if they are no longer meaningful to present day shopping practices. We likewise add messages when new suggestions and new ideas are presented.

2. We have a similar series of messages on slides for use in a 35 mm projector. Of course, the copy varies somewhat to make it suitable for such presentation, but the ideas are basically the same.

3. We recently completed two slide films in color for use in automatic slide machines, one visual only, the other visual with sound.

4. The automatic visual and audio slide machines are to be used in recreational rooms of large factories, store windows, branch libraries, public buildings, etc.

5. Special bulletins such as labels—meat grading—eggs—history of weights and measures problems.

6. Not current, but we used successfully in the past, records for spot announcements on radio stations. We plan a new series in the near future.

7. The Educational Director and myself have appeared on a number of local interview TV shows. Our plan for the fall is to include as many radio and TV programs as will be possible. However, we hope to substitute members of our Advisory Committee of prominent club women for staff members.

8. Booklet—I have with me a pasted-up proof of a booklet which we will have for general distribution as soon as it is printed.

Let us discuss the individuals and groups to whom we channel this information.

First, the schools. This program is taught in the Home Economics classes of the public and parochial schools of our City. We supply slides for illustrated lectures for the teachers, and for publication in teachers' manuals.

The whole program is under the guidance of our Educational Director who appears before women's clubs, community organizations, labor unions, and special groups and gives illustrated lectures. She is aided by our women shoppers and sometimes inspectors, when the work load necessitates it. She has also trained a few volunteers for talks before groups. We supply the material, such as slides, booklets, sometimes the machine.

We have felt that our program would be greatly augmented and aided if we had a women's committee. This, we are forming at the present time under the sponsorship of Mayor Richard J. Daley. The Chairman is the President of the Women's City Club of Chicago. The President of the Chicago P.T.A., President of the Chicago League of Women Voters and many other heads of equally notable organizations, as well as representatives of organized labor will constitute the committee.

In closing, I wish to state that with both clarity and force it is our aim to point out to the consumer the right way of shopping, rather than to disclose wrongs on the part of the merchant. As I stated in the beginning of this talk, the time-worn jokes about the butcher's thumb, and implied dishonesty have no place in a campaign such as this. Where dishonesty occurs, this is the duty of the weights and measures inspector to detect it and rout it out, protecting not alone the consumer, but the honest merchants who are in much greater majority.

This campaign is not primarily a publicity campaign, but in actuality it may do much to bring home to the public what a department of weights and measures really means to them.

REPORT ON FIRST NATIONAL WEIGHTS AND MEASURES WEEK

By ARTHUR SANDERS, *Executive Secretary, Scale Manufacturers Association, Inc., Washington, D. C.*

Like the start of a great many activities and programs, the kickoff of the first National Weights and Measures Week was modest. But the results of the first "week" were not modest, by any appraisal. The fraternity of weights and measures officials and those associated with them can be proud of their first effort in this direction and for the best reason in the world—it was a tremendous success.

Exchange of Ideas

In this sort of effort the exchange of ideas on things to do and how to do them is one of the real opportunities we have. No one person can have all the ideas. If they are pooled and made available to others, the net return to us all can be tremendous.

"A Sleeping Giant"

I wish it were possible here to review in some detail the splendid accomplishments made by weights and measures officials in promoting the "week" under the most adverse circumstances. Even though there is not time for that, we can say emphatically that weights and

measures officials are not slouches at promotional efforts. There is real talent throughout this group—enough so that we have heard the service called “A Sleeping Giant.” That remark was made as a compliment to the “ability” of sealers and to the opportunities and responsibilities which are theirs. In the minds of a great many, there are real opportunities for expanding and improving the service and the well-being of those engaged in it. National Weights and Measures Week is not the whole answer, but it may serve as a generator in many cases.

A Few Reports on Publicity Means

In a broad way a few of the promotional means should be mentioned, most of which originated with the sealers themselves. For example, in at least four States (Connecticut, Massachusetts, New Jersey, and Wisconsin), Governor's Proclamations were issued by arrangement of sealers. In at least a dozen instances proclamations were made by city mayors, county commissioners, etc. Now, a proclamation by itself does not do much, but the delayed action can be terrific, with the opening of publicity channels through which you can march with the publicity material. The proclamation is always a good starting point—a point we learned from the originality of sealers. Newspaper stories and actual editorials resulted in many localities from the personal efforts of sealers themselves. This, of course, is a prime medium for getting your story before the public.

A publicity means capitalized on by many sealers was to obtain the cooperation of retail food stores in carrying a corner announcement of the “week” in their ads. You may be sure these notices were read by millions of people, and it is probable that a large portion read of weights and measures for the first time.

Radio and TV developed into a surprisingly fine means of publicizing the “week” and there again it was due to the ingenuity of the sealers in presenting their proposition to the program directors. Radio “spot” announcements—those brief, 30 to 40 second prepared briefs—appear to have been made by the thousands. The showing on TV programs of available National Bureau of Standards and locally prepared sound movies resulted in many localities, frequently several times during the week and for as long as 15 minutes at one showing.

We are advised of quite a few instances where State and local sealers made personal appearances on significant radio and TV programs. One City Sealer made real accomplishment by getting his TV friends to make a sound movie and showing it. It will also be useful for later showings.

Mass communication media was not the only means used to tell the “story” during Weights and Measures Week. We have received reports from a large number of areas where personal appearances were made before large civic, school, etc., groups to give talks and show weights and measures movies. In one city alone, such audiences totalled over 3,000 people.

Why and How

By no means is the idea of a Weights and Measures Week a new thought. Particularly in the past couple of years we have heard it discussed at meetings of State and regional officials, where it has been enthusiastically endorsed. Why do we need a Weights and Measures Week? To answer briefly, the plan of having a promotional

week opens doors of the channels of mass publicity to hundreds of us connected with the service, which otherwise in many instances might not be opened. It furnishes the opportunity for us to practice (often-times as a beginner) an activity that is fundamental to weights and measures—public relations in the interest of public support for the service. With that practice we can learn the ways and means for seeking public support more frequently and more effectively.

A special week can offer many advantages of a coordinated nationwide effort, and of concentration on the awakening of the editors to the excellent reader interest in this relatively unknown service. It also provides the advantages of nationwide exchange of ideas and information on means of promotion.

This first effort should be regarded as something of a trial run. We are proud to be able to report the enthusiastic reception and cooperation of weights and measures personnel and the very significant accomplishments. To be quite frank, it seems that the trial run effort was necessary to get the project on the way. There was no organized support of the plan, and since discussion interest seemed to have passed its peak, the idea was beginning to lose momentum. Interest is like that, you know—the great enthusiasm begins to wane unless there is action as a follow-up of the words. It looked like now or never, so a few of us interested in weights and measures, calling ourselves “associates,” decided to announce the “week.” We did what we could to start the promotion and since then have been perfectly amazed at the interest generated and at the results.

To express an opinion, we think a National Weights and Measures Week has fully justified its existence. We think the achievements of 1958 are small to what can and will be done in the future. And, we think the spreading of the evidence of weights and measures service to all publics will create interest on a continuing basis among the editors who control mass publicity. We think the experience we will all get from our personal promotional effort will teach us how public support can be gained with even a minimum of effort. And, we think weights and measures service will improve and expand, to the benefit of the public and everyone connected with the service.

What Is To Be Done

It is evident that National Weights and Measures Week needs organized planning and the solid endorsement of the National Conference.

We found this year that we lost quite a few precious months in trying for a Presidential or other high official proclamation and in the end that effort faltered because it lacked National Conference endorsement. That situation need not happen again.

Such a promotional effort needs some form of organizational guidance and support. How that is to be arranged is a matter too large to consider in this short paper, but it needs to be discussed during this Conference, looking toward a running start for 1959. For example, in Hartford, Connecticut, where Mr. Raymond J. Marcotte is County Sealer, it was decided that a “National Weights and Measures Week” seal was needed. So, they went to work there and locally developed a most attractive seal. This was reduced to a mat for use in newspaper ads and appeared widely throughout New England in hundreds of ads, probably read by millions of people. Well, that is

the sort of thing that needs some organizational guidance for development and use throughout the nation.

I am sure there is enough organizational experience and talent interested in this effort to provide the guidance needed. Arranging for that guidance should be considered, and very quickly, to give a little formality to the program.

Conclusion

Even with a jumpy and very late start, the 1958 promotion of National Weights and Measures Week accomplished results far beyond the most optimistic expectations.

There is very considerable promotional talent and originality among weights and measures people and others who are interested. The "week" can be a success on a continuing basis, opening wide avenues for gaining public support for weights and measures, to improve the service and benefit the public and all interested in the service.

The promotional effort needs some type of formalization, guidance, and support in the very near future, possibly stemming from the National Conference, as the national body of weights and measures officials and associates.

(The Report of the Committee on Education, including the presentations of Mr. Levy and Mr. Sanders, was adopted by the Conference.)

REPORT OF THE ACTIVITIES OF THE WEIGHTS AND MEASURES ADVISORY COMMITTEE TO THE NATIONAL BUREAU OF STANDARDS

By A. T. McPHERSON, *Chairman, Associate Director,
National Bureau of Standards*

Under the uniform plan now in effect for advisory committees to the National Bureau of Standards, the Weights and Measures Advisory Committee was reorganized during the past year under the chairmanship of Dr. A. T. McPherson, Associate Director for Engineering of the Bureau. In addition to the Chairman, the membership of the Committee now comprises C. M. Fuller of Los Angeles County, California, Dr. L. J. Gordon of Denison University, C. J. McCaffrey of Ralph N. Brodie Company, Inc., R. E. Meek of Indiana, W. A. Scheurer of Exact Weight Scale Company, and S. T. Shaw of Safeway Stores, Inc.

The Committee met at the Bureau in Washington, D. C., on March 27 and 28, 1958. During the course of the meeting, the Committee heard reports on and discussed a variety of National Bureau of Standards activities in the weights and measures field. In its report to the Director, the Committee recorded its observations and recommendations on the following matters:

I. National Bureau of Standards Cooperation with State Weights and Measures Agencies.

The Committee approved of the efforts being made by the Bureau to determine the needs of the States for new State Standards, and of the plans for development and testing of prototype standards. It expressed the hope that the State Standards Program will continue as planned and will be carried to a successful completion.

The Committee felt that the participation of representatives of the Office of Weights and Measures in field training programs for

State and local weights and measures personnel has been very beneficial and should be continued. It was recognized, however, that these training schools make heavy demands upon the time of the Office of Weights and Measures staff, and that it may not be practical to increase the size of that staff sufficiently to be responsive to all potential requests for assistance with training in the field. For this reason it was suggested that consideration be given to the establishment of a special training facility in Washington, D. C.

As a practical approach to discharging the function of providing adequate training in the area of weights and measures supervision for State and local weights and measures personnel at all levels, when such training is requested by the State or local officials or agencies concerned, the following program was suggested for the National Bureau of Standards and specifically for the Office of Weights and Measures of the Bureau.

1. That a facility be established at the National Bureau of Standards in Washington comprising a classroom equipped for laboratory demonstrations maintained on a permanent basis exclusively for training purposes.

2. This facility to be equipped for lectures, group discussions, study, and demonstrations, including means for slide and motion-picture projection, and a full range of demonstration equipment comprising standards, balances, and typical commercial weighing and measuring equipment such that design and construction can be taught and field testing procedures demonstrated.

3. This facility to be designed to accommodate groups of from 1 to 10 students.

4. This facility to be used to supply information and training to administrators, technicians, and field inspectors, as required, whether of the States and Territories and their local subdivisions, or of foreign governments.

5. The training provided at the facility to be planned on a wholly flexible basis, adapted to meet special requirements as they arise, and to be given by the personnel of the Office of Weights and Measures and of the technical metrological sections of the National Bureau of Standards as required, under the general guidance of the Office of Weights and Measures.

6. Training at the National Bureau of Standards facility to be supplemented by classroom and field training at locations in the States, including practical field testing operations, given by specially trained members of the staff of the Office of Weights and Measures. (For this purpose, depending upon the requests and needs for the service, adequate personnel additions to be made to the Office of Weights and Measures.)

7. Pending the implementation of such a program as is outlined above, the Office of Weights and Measures to continue its current training program, but with increased personnel to the end that means for training may be increased and that participation in State and regional conferences may be maintained.

The Committee discussed the feasibility of having Office of Weights and Measures staff members assigned to work for periods of one or two months with officials in each State on a rotating basis. This has been suggested on various occasions by State officials. Though such a program would offer many advantages, the staff required would be of such size that the Committee did not consider it practical at the present time.

On the other hand, the Committee considered continued participation by Office of Weights and Measures staff members in State and regional conferences of weights and measures officials to be of the utmost importance and worthy of top priority in planning the work of that Office. These meetings provide a valuable forum for the discussion of mutual problems and have contributed greatly to improved uniformity in weights and measures administration. Participation by National Bureau of Standards staff members is vital to the success of such conferences.

II. *Technical Problems.*

It was the opinion of the Committee that there are several technical problems in the weights and measures field which require the expert technical assistance of the Bureau for a satisfactory solution. In particular there is need for work on methods for commercial measurement of liquid fertilizers and heavy fuel oils, improved techniques for axle load weighing, and new methods and equipment for testing of large-capacity scales. It was recognized that both funds and staff for assignment to these activities are limited. The Committee recognized that all are important problems, however, and expressed the hope that each may receive the attention of the Bureau as resources and facilities become available. In addition, the Committee urged that special attention be given to the possible application of electronics, hydraulics, pneumatics, and other new techniques in these studies.

The assistance which the Bureau has provided from time to time in the design and specification of equipment suited to the common needs of various State and local officials has been most helpful. Since the average State office is not well-equipped to handle such activities and because the investment in such special-purpose equipment often is sizeable, the Committee suggested that this service be continued and expanded within the limits of available funds. It was felt that it would be helpful if the availability of such plans and specifications might be more widely publicized.

III. *Functions and Services of the Bureau.*

The Committee expressed its appreciation for the informative review of National Bureau of Standards responsibilities presented by the Director during its meeting. It suggested that consideration be given to all means for improving general understanding of the National Bureau of Standards program and for clarifying the widespread misconceptions regarding the functions of the Bureau in this area. In this connection, the Committee suggested that consideration be given to the possible need for a publication describing the important, but indirect services of the Bureau to the consumer. The need for improved understanding of the manner in which the Bureau cooperates with other organizations to achieve mutual objectives was considered by the Committee to be equally important. It was the opinion of the Committee that such activity by the Bureau is an essential part of National Bureau of Standards "cooperation with the States in securing uniformity in weights and measures laws and methods of inspection" as authorized in the Bureau's basic legislation. The Committee suggested the advisability of a publication clarifying the relationship between the Bureau and State jurisdictions.

The Committee discussed the possible need for a *Weights and Measures Newsletter* to be issued periodically by the Bureau or with National Bureau of Standards assistance. Since it was understood that there may be an opportunity for discussion of this subject with the Conference Executive Committee during the meeting of the Conference, action on this item was deferred.

IV. *Other Items.*

The Committee commended the members of the staff of the Office of Weights and Measures for their outstanding efforts to further the many programs of that Office, and strongly recommended that

the staff be increased in keeping with the growing importance and complexity of these vital services. It was the expressed opinion of the Committee that at least two persons should be added as soon as practicable, one to assist in the training program, and the other to serve as technical liaison within the Bureau and with equipment manufacturers. The cooperation of industry associations in the training of additions to the Office of Weights and Measures staff might prove valuable and it was suggested that such arrangements be explored.

The Committee was pleased to learn that attention was being given to the need for improved coordination of the various metrology activities of the Bureau. It expressed the hope that these vital activities will receive full consideration in current planning to strengthen National Bureau of Standards services to the Nation.

SYMPOSIUM ON CONSUMER INTEREST

(L. J. GORDON, Director, Weights and Measures Research Center, Denison University, Granville, Ohio, served as Moderator during the symposium.)

DR. GORDON: When the Program Committee made the selection of a topic of consumer interest and chose the specific title "Legislation in the Consumer Interest," there was only one person in the country to invite to give this presentation, and the Conference is fortunate in having Dr. Persia Campbell for that presentation. She is a professional academic economist. Some years ago she wrote a book which is standard in its field, "Consumer Representation in Government." On the basis of her good work in that field and in Queens College in New York, Governor Harriman found her the logical person to do a pioneering job in the State of New York. She is now a member of his Cabinet and has the title of Consumer Counsel to the Governor of New York. Since her appointment in 1955, she has been doing an outstanding pioneering job in which she has shown creative imagination.

LEGISLATION IN THE CONSUMER INTEREST

By PERSIA CAMPBELL, *Consumer Counsel to the Governor, Albany, New York*

This afternoon's session of your Conference program is a significant occasion both for sealers and consumers. Obviously, these groups have a mutual interest. What is particularly significant about this session is the prospect of a recognized and active partnership among them in working toward a common objective.

In trying to strengthen this partnership, I suggest in the first place that the development of adequate law and law enforcement in the field of weights and measures be considered as a part of the larger over-all program of consumer protection.

As Consumer Counsel to Governor Harriman since 1955, my functions have included support for and coordination of existing consumer services now being carried on by units of various departments and agencies of the State of New York. These services were set up over the years in a piece-meal fashion, in response to sporadic demands for the control of abuses in various areas of consumer interest—weights and measures, food and drugs, bedding, personal services, credit, utility rates, promotional practices, and so on.

I soon found that very few consumers knew about these existing services, and, what was even more disturbing, in a number of instances the directors of these services knew very little about each other. They usually failed to realize that they were each contributing to a pattern of consumer protection that took on more meaning and gave more meaning to each of its parts when looked at as a whole.

My Office has published two little booklets, "How Much Legal Protection Does New York State Give the Consumer?" and "Consumer Laws in Action," to present briefly the nature and extent of this over-all pattern of consumer protection as provided by New York State. The first booklet summarizes the many and various laws scattered through our statute books relating to consumer protection. The second booklet illustrates some of the problems encountered by the responsible agencies in putting these laws into effective action. These administrative units are also scattered, one or more being set up in most of our major State departments. There has been no formal arrangement for consultation among them in regard to their consumer protection function, though an informal interdepartmental committee now meets from time to time to advise with me, as Consumer Counsel.

These services are not competitive with each other, though certain jurisdictional problems do arise. I am sure representatives of the responsible agencies can give each other more effective support as well as gain more support from the consumer public through better coordination and understanding both in the headquarters administration and in the field.

My Office has organized a number of local community conferences to which representatives of different government agencies providing consumer services have been invited so they will become better acquainted with each other as well as with representatives of consumer-orientated groups in the community. This applies to consumer protection services at all levels of government.

While it is important to get this over-all view of the consumer protection services provided by government, it is also important for consumers to recognize the significance of their over-all function in spending the family income. I am delighted to see that you have plans for a consumer education program. I hope that in developing these plans, you will emphasize not only the area of weights and measures for which you are directly responsible, but also that this area is part of a broad field of consumer interest. The sustained willingness and ability of consumers to act intelligently with respect to weights and measures depends, I believe, on a general development of consumer consciousness and awareness of the consumer role, not only in terms of the welfare of the family but also of the economy as a whole.

A dollar is only worth what it is exchanged for in goods and services. Each dollar represents an amount of someone's labor and if the greatest value is not received for it when it is spent, some of the original labor that went into making it, is wasted. Of course, the goods and services for which the dollar is exchanged must satisfy wants to be of value. They will be of greatest value when they satisfy wants in order of their real importance to the family and its individual members. Consumer education must therefore relate to the underlying pattern of wants in the first instance, and then to the

broad categories of expenditures through which these wants are satisfied and finally to the job of selecting particular items at the market under varying conditions of sale. It is at this point that information and advice with respect to quantity and weight as well as quality and price must be brought specifically to bear. But such information and advice will have more telling effect if the over-all problem of stimulating consumer awareness is recognized and tackled by all concerned in any aspect of consumer education. I am sure Professor Warne will agree with me that the great mass of consumers has very little of this awareness.

Furthermore, the way the consumer function is carried out, the way the family income is spent, is not only a matter of concern to the family but to the economy as a whole. The Presidents of the Federal Reserve Banks recently asserted—and they can hardly be accused of flighty statements—that the trend of the current “recession” will be determined largely by consumer behavior. If a larger percentage of income is saved, or if present income is overspent through installment buying, the effects will be felt throughout the economy. Of course this is also true with respect to the way income is spent—whether, for instance, materials and labor and machines will be applied to frozen prepared foods or diverted into other lines. Consumer education should be developed within the framework of these wide horizons even though it is focused specifically on particular problems.

With respect to particular consumer problems such as those relating to weights and measures, consumers must learn to function effectively both at the market and also with respect to government action.

With respect to weights and measures as such, New York State already has a basic law, but it must be reevaluated to take account of constantly changing conditions—no doubt these call for amendment and expansion of the law from time to time. It is administered by the Commissioner of Agriculture and Markets through a State Director of Weights and Measures, Mr. John J. Leonard. I hope the Director agrees that our relations are very cordial, though under the pressure of my program priorities, I have not had time to give to the work of his Bureau the consideration it should have, other than to support particular legislative amendments he has sponsored, such as the recent change in the “fill-point” of milk bottles which has saved consumers of our State probably from \$1 million to \$1½ million per annum.

It is most fortunate that Dr. Leland Gordon is concentrating his attention on weights and measures. As a college professor, I have at times felt rushed and harried, but compared with the circumstances of political life, I can now assure Dr. Gordon that the campus is a center of academic calm, of opportunity for reflection on political matters which cannot be reflected on when they get to the point of political decision. I hope that with the partnership of experienced officials and academic associates, we shall get rational guidance on the development of law and its proper administration in the weights and measures field. Law is a means for channelling the forces of change toward the social objectives we believe to be good. We must see to it that the channel is well-laid and particularly that it points in the right direction.

It was to ensure some voice for consumers in the making of political decisions in New York State, that Governor Harriman appointed a Consumer Counsel to his Executive Staff, with cabinet rank, when he took office in January, 1955.

As Consumer Counsel, my main function has been to advise the Governor on matters coming before him for decision from a consumer point of view. To keep in contact with developing consumer opinion, I have set up a State Consumer Advisory Committee of some 40 persons representing for the most part, lay organizations with a consumer interest. I meet periodically with this group and contact individual members from time to time on particular issues with respect to our legislative program and also on consumer education.

In developing our legislative program, it has been necessary to establish priorities among consumer problems calling for government action. For the past three years, I have been mainly concerned with preparing and supporting through the State Legislature a package of bills constituting a far-reaching program for the proper regulation of all types of retail installment sales of goods and related services. Many abuses had developed in this area, particularly associated with the rapid expansion of the installment credit system. I am gratified that this program is now in effect, and is being vigorously administered through a new Sales Finance Division in the New York State Banking Department. The Division is presently engaged in an extensive educational campaign to acquaint consumers with their rights under the law, so they can cooperate in making it effective. Such a partnership between government officials and the public is, I believe, essential not only for effective administration of particular legislation, but to ensure a vigorous democracy based on citizen participation both in law-making and law-enforcement. Governor Harriman has given this program his full support.

I have also been much concerned with the need for strengthening the existing Penal Law relating to false and misleading promotional and sales practices; and for developing a new section of law providing for civil remedies for a consumer who has suffered damages from such practices—whether they arise from fictitious or misleading price, quality, or quantity claims. This has proved to be a hard battle, but some ground has been gained.

At the market, consumers usually act individually without any sense of a community of interest with others on the same side of the counter; they usually act with a degree of timidity or unconcern that seems particularly apparent when they are at the scales. For some hard-to-explain reason we will count our change more openly than we will check the weight of what we buy, though even in counting change there is often a feeling of uneasiness, almost of bad manners. This is more evident in the neighborhood store than at the supermarket, and reflects, no doubt, a delayed reaction from the days of small-scale distribution in a scarcity economy; it may also reflect a sense of incompetence in making quick calculations. It certainly reflects a lack of consumer consciousness of the responsibility of the consumer role in the economy. It gives an advantage to the less scrupulous operators in business. Responsible businessmen represented through the Better Business Bureaus and Chambers of Commerce have made it clear on different occasions that they would welcome a greater development of responsibility among consumers.

of an informed determination to get the "best buy" under the most desirable conditions of sale.

Consumers have been equally unaware of or, at any rate, apparently unconcerned about the impact of government action on their interest. Sporadically they have been roused to political action or at least enough sentiment has been developed to result in the consumer protection services now provided by government at different levels. But there has been no effective organization among consumers on a continuing basis so that the consumer point of view could be brought to bear regularly on the process of political decision.

It is indeed not generally realized how much of government action is economic in character and therefore affects directly or indirectly the consumer interest, whether favorably or unfavorably. Other economic interests have recognized the significant role of government even in our "private enterprise" economy and have organized pressure groups to ensure action favorable to their point of view; they have also obtained support in representing and promoting their point of view; through specialized departments of government such as the departments of agriculture, commerce, and labor. Not only are consumers unorganized or at any rate not organized for effective political action, but they have had no representation in the structure of government, except for a few experiments in the early 1930's under the New Deal.

If consumers are to cooperate with you intelligently, they need guidance:

A. First of all with respect to the basic law on weights and measures. This law from a consumer point of view has a two-fold aspect: One to prevent fraud and misrepresentation, and the other to help consumers make a wise choice at the market. Does the law in either aspect need to be amended or expanded? For what purpose and in what manner? With the rapid development of new products and new techniques of distribution, the problem of appropriate measurement of quantity and weight, and of making that measurement known to consumers in a meaningful way, must be a continuous one.

There seem to be four main divisions in the basic law:

(1) relates to the requirements with respect to weights and measures devices and the manufacture of them. Some years ago, Fiorello La Guardia, when Mayor of New York City, used periodically to arrange for a very dramatic dumping at sea of confiscated scales, to attract public attention to this aspect of the weights and measures program. Consumers can do nothing directly to check the device, but they can help ensure that sealers have necessary legal authority and administrative support; they can give you moral support in your work. I hope you will encourage manufacturers of weighing and measuring devices, to construct them so their findings will be revealed clearly to buyers as well as sellers.

(2) relates to the requirements for disclosure of weight and measure, particularly on cans and sealed cartons, a prominent feature of our "package" economy. Is the coverage of the law adequate? These requirements should be in the public interest but at the same time they must be realistic. What should be done about shrinkage in prepackaged meats? We require that scales be placed near the point where prepackaged meats are sold so consumers can check the declared net weight before making a purchase; but if they do not know the weight of the container or wrapper, how helpful are the scales?

(3) relates to the required use of standardized sizes or measures or practices. Milk can only be sold in certain standard-size containers. Should this principle be reestablished for all kinds of canned goods, as during the OPA period, so consumers can make a quicker reckoning of quantity-price advantage? Small changes in weight can be used to conceal rising prices.

We require that cooked chicken with dressing be sold by weight; but this means that the dressing may be paid for at the same price as the bird, particularly since the comparative price for uncooked chicken has to have some indeterminate amount added to it for services—should there be some change in the requirement?

(4) relates to provisions of the law designed to prevent and control misleading and deceptive practices as such—the “thumb-on-the-scale” technique, or the “scale-set-above-zero” technique. Since such a high proportion of the abundant supply of goods on our present-day market is canned or packaged, there must be a considerable problem related to checking quantity-control practices on the production line itself. From your experience, what are some of the practices that consumers should be specially alerted against?

B. The second broad question in the weights and measures area of consumer protection, has to do with administration of the law. Dr. Gordon has already pointed out some of the difficulties he discovered in his survey of the structure and practice of administration. These difficulties should be further explained and discussed so they can be overcome, if consumers are to realize the greatest value for your services.

You have been working, I am told, towards more uniform regulations and standards of practice throughout the country. From a consumer point of view, uniformity is desirable if it is at a high level; but uniformity at a minimum level, which might tend to become the maximum, has obvious disadvantages for consumers that might outweigh the advantages.

Commissioner Daniel J. Carey pointed out at your last Conference that we have problems of administration in New York, and, no doubt, they exist elsewhere, that arise out of conflicting State-local jurisdiction. These problems call for a constructive solution which is delayed by lack of consumer awareness.

C. This leads on to a final question. How can consumers more effectively cooperate with you? To the extent that they become better informed and more responsible in their behavior at the market, they will influence the less scrupulous merchants to be more cautious with respect to their practices. But to take advantage of the protection provided by law, and by your administration of it, consumers must know more both about the law and of the work that you are doing. I have greatly appreciated the willingness with which our officials, both State and local, have responded to my request that they address consumer-oriented groups, or participate in radio-television programs; I know this is an additional burden on their over-crowded time. They have urged consumers to report any violations they find to the appropriate agency.

I hope your Committee on Education will prepare informational materials suitable for mass distribution. One of the major problems we have in consumer education is to communicate with the consumer public in terms they understand and will respond to. Without effective communication, we will not get active cooperation from consumers in supporting your efforts on their behalf and in working with businessmen to establish conditions at the market that will lead to mutual confidence and respect in economic dealings. Such confidence and respect are necessary foundation stones to a democratic society.

DR. GORDON: One of the success stories in the past generation has been the birth and the growth to maturity of consumers' unions. That is almost the product of the creative imagination of our next speaker. Chester Warne is a Professor of Economics, and has served as President of the Consumers Union since its founding in 1936. He has given the imaginative leadership and courage to the Union. He has learned a great deal. He is a very knowledgeable man in the areas of consumer information. For many years Consumers Union concentrated, and I imagine it still does, on quality. How can you and all consumers relate quality to price?

I remember very well a conversation with Dr. Warne in Detroit, Michigan, in December three years ago, and I suppose I was just beginning to relate weights and measures to the three aspects of every exchange transaction—quantity, quality, and price. So I proposed the idea that, if Consumers Union would provide the support, perhaps I might make a study of the quantity aspect of the exchange transactions. Formal request was made to the Board of Directors of the Consumers Union and a grant was made, and that is how my study was commenced.

This afternoon we are fortunate to have as our next speaker Dr. Warne, President of the Consumers Union.

PACKAGING AS A TECHNIQUE OF DECEIT

By C. E. WARNE, *President, Consumers Union, Mount Vernon, New York*

There is no area of buyer information that so dramatically illustrates the advantages held by the business buyer over the ultimate consumer than the area in which you gentlemen operate. Take almost any issue of the magazine *Purchasing*, a trade journal for purchasing agents for business firms, and you will find accounts of a number of standards programs—programs to standardize the sizes and weights of the materials used in preparing the final product that we consumers buy. Of course, business buyers frequently go much further in many of their standardization and specifications programs. But let us stick to just this basic simple problem—standards of size and weight.

There is, as you here well know, no more fundamental requirement in trade than standards of weight and measure equally understandable to buyer and seller. These are even more important in trade than in monetary units. When money standards fail, barter is always possible; but even for intelligent barter, the standards you here are empowered to enforce in our communities are essential. This is why around the story of weights and measures there glows a patina of beneficent history as opposed to the catastrophic glare of military triumphs. Trade is peaceful and fair and understandable; trade transactions benefit all parties. These workaday standards are usually reported, and correctly so, as one of man's first attempts to introduce a rational basis for fair dealing in trade. They appear to mark not only the beginnings of a more satisfactory commerce, but also the extension of ethics deeper into the affairs of everyday life. These standards are the buyer's first defense against fraud. Behind their establishment there is a long inch-by-inch journey over the years which is an important part of our many attempts to rise into a more controllable environment. Here we deal with an alphabet in social survival. These, your weights and measures, are the hand and finger contacts through which we try to build and preserve a cohesive society.

If it seems to you that I am over-romantic about so simple a thing as a standard weight, let me say that it seems to me that it is precisely these things we experience day by day in our least pretentious activities that are frequently those very happenings which, a thousand years from now, historians will view as more significant than the slogans and fears that now agitate us. It seems to me that, when I say that business buyers apply and use these measurements increasingly but deny their use to the ultimate buyer, one of the things I am saying is that the general public is being robbed of its heritage. I do not need to tell you how long a heritage it is. You here know about King Dungi's standards of weights and measures for Babylonia back in 2350 B.C.; but I am afraid that perhaps the public does not know. I am afraid that we have all been not too romantic but too prosaic in our approach to the problems today's market poses in this area.

Who, on going into a supermarket, ponders long over the fact that goods are now packaged to confuse and mislead ultimate buyers? This is a return to *Caveat Emptor*, to be sure, and we all admit it, but what does such a return mean? What does it mean to a society

when the mechanisms whereby its sustenance is provided are fouled with sharp practices?

You here have worked long and hard to introduce basic fairness. You have chalked up some notable achievements. Scales are more reliable today. Knowledge of basic units of weight and measure are more widespread. In the case of some goods like bread, milk, and dairy products, sizes are fairly well standardized. These are indeed victories. But they are, and pardon my bluntness here, old victories. Except in those areas where standard sizes are required by law or prevalent because of trade practices, market-place developments since World War II have robbed us, the consumers, of the fruits of your hard won victories.

Honest scales stand idle while supermarket pushcarts are filled with prepackaged goods and other goods that are double and triple-packed in sizes and weights designed to conceal their comparative value. The brand explosion of these past fifteen years has presented the twentieth century consumer with a market place where rational trading transactions are less available than was true on the market where the medieval peasant traded.

Shortly before coming here I made a single trip to a supermarket where, without any preconceived plan to follow, I simply wandered with open eyes and a pad and pencil for less than an hour. Here are a few of the things I saw. I am not offering them to you as anything startling. Anyone of you here could doubtless furnish me with data much more remarkable. I am offering these examples only to illustrate what a layman in your field can see with but a little guidance, a clarification of a point of view, a hint as to the broader meaning that may lie behind the chaos of packages in a supermarket today.

The first shelves I came upon contained cosmetics and drugs. These racks were probably placed for easy access because the profit margin in these items is so high, comparatively, with many food items. There I picked up a package of toothpaste—a toothpaste whose advertising appeal was designed by motivational researchers in advertising. Its sales have been phenomenal, according to trade reports, and all because its advertising relieves you and me of a feeling of guilt. Here in the supermarket I found this toothpaste in four sizes at four prices. The prices were: 83 cents, 69 cents, 53 cents, and 31 cents. The 31-cent size was nearly all gone. It appeared that it was the biggest seller. But which of the sizes was truly cheapest? That, of course, depended on the ratio between cost and quantity—so I looked for the net weight, which as I know is required by law. I could not find it. I turned the gaudy cardboard carton over and over, looked at the squared ends, but no net weight was there. Glancing over my shoulder to see if a manager might be about, or any observer who might misunderstand my actions, I pulled open the top flap where now and then I have found the net weight. But no weight was there. Carefully I took the tube, the big one (I had started with the 83-cent size), out of the box and there found, after turning it over several times, that it contained $6\frac{3}{4}$ ounces. One after another, I opened each of the other three sizes to learn that they contained, respectively, 5 ounces, $3\frac{1}{4}$ ounces, and $1\frac{3}{4}$ ounces. I had to resort to my pad and pencil, leaning against a closed counter end, to learn that the small size, the 31-cent size, cost 40 percent more per ounce of net weight than the big size. That is, it cost that if my hasty arithmetic was correct.

At the same shelves, however, was another product—a hair oil—where the larger size represented a savings of less than 1 percent. Here, too, I had to take the bottle, a thick glass deceptively shaped, out of a very generous cardboard box in order to find the net weight.

From there I wandered past instant coffees which caught my eye because there were so many brands and so many sizes. Most brands came, however, in 2-ounce and 6-ounce sizes, with here and there a 4-ounce size. The 6-ounce size was proclaimed on its labels to be the giant economy size. Right among these 6-ounce economy giants, however, was a maverick. One national brand's largest size, which looked the same size as the rest, contained only 5 ounces. Its price seemed such a bargain, \$1.09 as opposed to the \$1.29 price of its competitors. Again, it took a retreat to the counter top with pad and pencil to learn that actually this brand was more costly; its cost per ounce came to 21.8 cents as opposed to its competitors' per ounce price of 21.5 cents. Not a vast difference on an individual purchase, but multiplied by the billions of transactions on the market place, a sizable toll. Furthermore, if I were any of the competitors of that particular brand, I would feel that the pricing and packaging of that instant coffee was as much unfair trade practice as any exaggerated advertising claim.

As a matter of fact, this is what has happened to packaging in this day of self-service out of giant supermarkets. Packaging has left its mundane role as protective and convenient wrapping for merchandise to join the primrose path of promotion. Packaging is widely hailed as point-of-sale advertising. In addition to a package designer, packages are now the result of the pooled efforts of a number of disciplines: sales manager, psychiatrist, motivational researcher, color hypnotist and what have you. In this burst of the package out of the field of utility into the field of promotion all the trickeries we have so long associated with the promoter have come to roost on our product shelves.

I took a quick look at pimento filled olives, for example. I could not stand to stay there long enough to make detailed calculations. By the time I had copied down only price and net weight I was too disheartened to do more. Here is what my notes read: a 2-ounce size priced at 15 cents; 3-ounce, 33 cents; 4½-ounce, 39 cents; 4¾-ounce, 33 cents; 6-ounce, 59 cents; 7¼-ounce, 59 cents; 10-ounce, 59 cents; 13¾-ounce, 49 cents; 1 pound 6 ounces, \$1.69. These were only the glass jars I looked at. There were cans galore there, too. It would have made more sense to have checked the whole green olives which come in both packages but I was fed up on olives by this time.

A friend of mine who works with one of the largest grocery chain stores in the country said to me recently: "You and your consumers. Look what is happening. The competition has come out with a 6-ounce package of baloney. Its real price per ounce or per slice is higher than that on our eight-ounce package. But the suckers go for it. So now we are probably going to have to join 'em since we can't lick 'em. It is going to cost us all more."

There is not much sense in my giving further examples of misleading packaging, which I saw in tea, powdered milk, liquid detergents, giant economy size all purpose detergents and so on. The story is the same. You know it better than I do. What I would like to suggest, however, is that perhaps the time is riper than we think for a change.

There has been a growing agitation in Congress over the marketing spread, the cost of getting food to the consumer after the farmer has been paid. That spread has increased enormously since the war, World War II. Food processors and retailers are, themselves, worried over their rising costs. They explain it all to the public as the result of taxes and labor costs and the added value they put into ready-to-cook foods, the so-called "maid service." Actually the maid service is seldom an added cost. But the packaging madness is. It adds cost all down the line. The manufacturer who puts out his product in needlessly multiple sizes increases his labor and overhead costs as well as inventory costs of packing materials. The wholesaler and distributor costs are increased by heavier, slower moving inventories. And the retail grocer's costs are pyramided by this meaningless product differentiation. And finally, of course, we consumers are befuddled and robbed of our ability to buy the best possible living our incomes might afford.

This is a great loss to the economy as a whole—this loss of rational buying on the part of consumers. The farmers as well as the consumers lose directly; but so, in the long run, do the very perpetrators of these practices. When promotional competition takes over from price competition, when sellers deal in bad faith with buyers, a kind of commercial corruption spreads like a cancer. The quality of goods declines. Honesty is penalized and chicanery rewarded.

But, as we have all said so often, we are all consumers. We all eat, wear, drive, and use these goods. The environment in which we buy has deep significance in our whole social outlook. That is why I wax romantic about the loss of our heritage in the uses of your weights and measures on today's market.

I am very glad to be here today. I know you have heard and said to yourselves often that public understanding and public support are essential to the best success of your job. The promotion of public understanding of such problems, as the ones you tackle, is a matter of first order of importance to us at Consumers Union. You here know all too well how difficult it has seemed in the past to achieve public awareness. The remarkable growth of Consumers Union these past fifteen years, however, should give you some encouragement. Here is a medium dedicated to the problems with which you are working from the point of view of the general public welfare.

Furthermore, it seems to me that for you and for us at Consumers Union there may be one tiny thread of silver in the dark cloud of this recession. During the heyday of the boom, during the height of promotional circusing, it was hard to call attention to totals that could be lost by the pennies that slipped away every day. Now those pennies are becoming more important. For some families they are vital. And for the whole economy, waste is less easy to overlook. So, as I said before, perhaps this is the time when, once again, there will be a chance to shift the trend back toward more sanity and more fairness. Perhaps now is the time to attempt to make the consuming public more aware of how much it has at stake in legislation setting up standard sizes for a broad range of consumers' goods. Certainly we at Consumers Union are much interested in further pursuing this idea which, I know, has been many times discussed by you here.

MR. TURRELL: Dr. Warne, did you check on the weights of those small packages?

DR. WARNE: Whenever we do testing of products, we are very meticulous about that. We have 100 shoppers across the country who buy the samples and relay them to our central office in Mount Vernon, New York. We are very careful to determine whether the actual weight conforms to the labeled weight. But in the case of this little survey in the supermarket that I discussed in my speech, I was just posing as an ordinary shopper to examine the sort of problem that a person faces in a supermarket and did not check up on the weights.

MR. TURRELL: We have done some checking in Pennsylvania, and my comment is that those smaller packages are more apt to be light than are the larger packages. Another thing I would like to know: What would you suggest as to a possible solution to the problem of nonstandard sizes of packages?

DR. WARNE: I would start with the attitude that the markings ought to be on the outside of the packages. As a second stage, I would hope that standards would be developed through common trade fields, say, the soft drink field, or through legislation, if necessary, such that there would be certain recognized sizes. From this point, I think Dr. Campbell should comment because she has given much more attention to this aspect.

DR. CAMPBELL: We have made suggestions for standardizing, but have not had enough support to move the suggestion into the form of legislation. If you gentlemen, with actual experience in the field, feel that you could support standardization of sizes for packages or cans, it would be a tremendous help to consumers. As you know, such standardization was accomplished under wartime conditions and even immediately after the war, but there was no active organized support to maintain standardized sizes.

MR. C. M. FULLER: I am most happy to know of the interest and support of Dr. Campbell and Dr. Warne. Many of us will remember the interest that was taken some 15 or 20 years ago by the National Conference on Weights and Measures in the proposition that there were too many sizes of packaged goods for the very reasons that Dr. Warne has brought out. We were successful in having a bill drawn up and introduced in the Congress, but there was so much opposition that we were not able to get it passed. Now, I hope, with the support of organizations such as yours, that we will be able to go ahead with something of that kind again.

MR. LEVY: Let us admit that under our present system the competition is such that, among food packagers and food manufacturers, hard selling, or advertising, or promotion may be felt essential. Would these people not be left enough opportunity for exercising ingenuity in their promotional programs if they were required to do away with odd sizes of packages? Should we make a move that odd sizes be eliminated as a method of competition?

DR. WARNE: I think you have an excellent idea. In fact, I feel optimistic that some of this competitive race of stepping down the sizes may have within it a self-curing force, in that certain companies might conceivably take a firm stand and suggest that they have in their package a full pound, for example, and emphasize the even sizes—1 pound, 2 pounds, and so on.

I have displayed before some 50 students two different packages of salt. One package contained a pound, 10 ounces, and the other a full 2 pounds. I asked the students to judge, at a distance of 3 or 4 feet, which was the larger in terms of content. With few exceptions, they chose the 1-pound 10-ounce container. This had been scientifically designed in such a way that it looked to be much larger than the 2-pound container, and I suppose it was sold in the expectation that the buyer would not read the label. There is that factor of deception. Keep hammering away at the consumer to read the label. Work also with the manufacturer and encourage him to state accurately the contents of his packages, the qualities, and the quantities, and he may receive greater support and allegiance from the consumers.

MR. JACKSON: I believe that this matter of limiting the sizes of packages is fully in the public interest. I would be inclined to go along with Dr. Warne's comment that we can be hopeful that the general weight of the cost of packaging will help to eliminate the multiplicity of sizes. If our past experience is of any consequence, it would appear to be a considerable task to get a standard commodity setup in this country. There is the question as to whether or not the sizes should be limited by law. Attempts in this direction have not been generally successful.

DR. WARNE: I do not think any State legislature is apt to pass a binding law that specifies acceptable sizes for all commodities on sale in that State. I think we will have to work our way into particular areas. We have tackled the slack-filled package problem to some extent, but it seems to me that there must be more research into this standardized package area to get at the facts about the cost to the consumer, the nature of the abuses, and the illegal techniques. Thus far, in our Consumers Union work we have been so terrifically busy keeping up with the expansion of consumer products and with the problems of comparative quality among products that this issue, while important, is something we have touched on only lightly.

DR. CAMPBELL: Let me go back to some of our own legislative experience. I was explaining that we have not done much in New York State yet and that, as Consumer Counsel, I have not done much because there have been other areas of abuse that we felt had to be tackled first. I think we can properly be optimistic about certain areas in which we have concentrated our work. Whether there is a really co-ordinated effort in the field of standardized sizes is a question. This issue would have to get a considerable body of people, experts and others, to feel that there are sufficient abuses for the exercise of the power of the State.

I do not know whether, within this Conference or outside of it, you have unified opinion as to the need for additional laws. But even if you get legislation, there is the very real problem of effective administration of the law, and my feeling is that perhaps there is more law in this field than is effectively applied. If you want more public support, you could get much further with existing law. Of this I am not positive, but I have the feeling that, even with no public support, more effective administration of existing law might help to control some of these practices.

I might add that we could never have moved forward in our consumer legislation in New York State without the active support of a Consumer Advisory Committee. We have representatives on this

committee from the AFL-CIO and other organizations representing consumers. The committee totals about 40 people, representing such organizations and also including some consumer experts. I think it is of basic importance, in order to move a program forward, to rally the interest of the people as consumers arounds the experts; you need expert guidance.

MR. KERLIN: I do not know whether you realize the tremendous opposition that we, as weights and measures officials, encounter when we attempt to sponsor consumer-protective legislation. There is opposition from not only industry, but from legislators themselves, when a law enforcement official or a law enforcement group sponsors legislation that actually should have been sponsored by consumer's groups. I believe that all of us would support any consumer legislation to the best of our ability.

MR. BAUCOM: Several thoughts occur to me. First, who is responsible for all these package sizes and the present trend toward smaller quantities. It is not the stockholder of the company; it is not the engineer. It is the advertising department that bears the greatest influence. We find this in all fields. Presently one man is advertising more gas per gallon. How are you going to get more gas per gallon?

It seems to me that we need to get beyond the advertising agent, possibly into the engineering or management parts of the organization.

The next point I should like to raise is, what do you consider plain and conspicuous marking? You, Dr. Warne, had to open a package to find the quantity statement. We find declarations on certain packages in print so fine that we have to get a magnifying glass to read them. I think we need to get the meaning of the words "plain and conspicuous" spelled out so that customers going down a package display line can see how much they are getting for their money, whether is is an ounce or an ounce and a half, a pound or a pound and a half.

Do you have a consumer organization in every State or some agent we could contact or work with? I will be only too glad to work with such an agent in my State, because we need the consumers to back us up.

MR. GREENE: Whom can we contact in our State when we feel the need for legislation to protect the consumer and accordingly have drafted a bill? Can we go to the Consumers Union or any organization of that type and submit the bill to them? If such organizations approve the bill, how can we get their support at a hearing before a legislative committee?

DR. WARNE: Let me explain what we can do and what we cannot do. First, we are, under the law, a nonprofit tax-exempt organization. Hence we, as an organization, cannot serve in a lobbying capacity. We can give advice, let us say, but we are not set up to render direct assistance in amending legislation, even though, like any American citizen, we do have the right to express a viewpoint, and we do express a strong viewpoint toward fair trade laws—toward a lot of these laws in the field of weights and measures. The person in our organization who, being our educational director, has responsibilities in this area is Mr. George Goss. He has been of considerable assistance in this field. We do have representatives in

quite a number of the States, and, if they may be of assistance to weights and measures people, they will be happy to be contacted. Just write Mr. Goss in care of Consumers Union, Mount Vernon, New York, and he will put you in touch with our representative in your area.

I fear that I may be tempted to overstate what we can do in the sense that I wish we could be of real assistance in all of the States. I think that, from a practical standpoint, any one of you would find more active assistance right in your own jurisdiction by getting in touch with the Advisory Committee of the Food and Drug people, such as exists in many of the States, and with some representatives of the labor organizations. I am sure that consumer committees, such as the one in New York, would have a very vital concern in this field.

DR. CAMPBELL: In my position I am responsible to the governor and must see that he receives an accurate representation of the consumer's point of view. I can spearhead legislation in the consumer interest. We have developed a consumer program, the success of which is principally attributable to our Consumer Advisory Committee.

I have tried to organize all of the consumer interests in the State so that, when we propose legislation or oppose legislation, it is apparent that our viewpoint has a considerable body of support behind it. Even then, we must fight our bills through the legislature, and this requires organized support against the activities of very strong pressure groups. It is no use pretending that these do not exist. They do exist, and the only way we can move legislation forward—legislation that you believe to be in the public interest—is to get a certain amount of support from responsible elements in business and from other groups that are concerned, to reestablish ethics in the market.

With the consumer groups behind you and also with the support of legislators who realize the public response to these kinds of issues, you have very real voting appeal. If you can convince the legislators that there are votes involved and election support for these issues, you can move them forward very much faster than you could otherwise, but it is not an easy process. It is part of the entire drive of democratic action.

MR. SPINKS: Last year, as President of the National Scale Men's Association, I traveled all over this country trying to promote the idea of weights and measures people and representatives of industry, such as sales engineers, servicemen, and sales people, getting together, because we need a larger group to advance our program. If this could be done, we would not leave it up to the weights and measures man alone to promote consumer legislation, but the industry men, the oil men, the scale men, all will be in a position to join with him in the promotion of legislation for good government. We can organize the consumers too, but the first thing we need to do is to organize weights and measures and industry people.

MR. LEITHAUSER: Some years back in the National Conference on Weights and Measures, a committee was appointed to work toward the standardization of packages and a bill was introduced in the Congress. The bill failed because industry claimed it would cost millions of dollars to change over machinery, change over packages,

change the shelves, and a lot of other things, and I do not think we will get anywhere by trying to get a bill through Congress now that we have the same pressure group to defeat as existed before.

I think we might approach the standardization of packages from another angle. If we were to get consumer groups to refuse to accept these nonstandard packages, we might get somewhere. A manufacturer is not going to put out a package that does not have consumer acceptance. So I think it is something for the consumers to consider. If they want standardization of packages, this is one method to get them. Our Maryland Weights and Measures Association does invite the consumer groups and the farm organizations to its annual meetings and solicits their cooperation. I think some of the other State organizations should invite these people to their meetings and get their support also.

MR. RANDALL: We have been discussing the multiplicity of package sizes. I gather from your talk, Dr. Warne, that it seems that the present tendency is to package for promotional purposes rather than for utility. I think that is very appropriate terminology, but oftentimes weights and measures officials have a difficult time determining which is which—which is for utility and which is for promotion. That is an area where the consumer should step in and help us. It is most important that every consumer group that we can get in touch with send a representative to this Conference every year so that we may have their advice and counsel on these matters, and then we can plan wise legislation that such groups will support.

MR. KERLIN: Dr. Warne, I should like to go back to the subject of legislation. I can foresee a potential in your organization that I certainly hope you realize. You have said that you are prohibited from lobbying, and I assume that is because of financial considerations, among other things. But many of the readers of your periodicals are women, and many of them belong to women's groups. Through your publications, could you not bring to these women an understanding that they can help with consumer problems? If they would contact their local weights and measures officials and cooperate with them, the members of your organization would be of great help to us when we appear before legislative bodies.

Recently, in California, a bill was introduced that, if enacted, would have been devastating as far as our weights and measures activity is concerned and that was actually against the consumer interests. I got in touch with three ladies who were officers of the Affiliated Women's Clubs. They went to Sacramento with me, and, after they spoke at the hearing on that bill, its author asked that the bill be withdrawn. Legislators listen to women. Your magazine, Dr. Warne, can be of the greatest help to us in our efforts directed to the consumer's protection.

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 11, 1958

(S. H. CHRISTIE, JR., VICE CHAIRMAN, PRESIDING)

REPORT OF THE COMMITTEE ON LAWS AND REGULATIONS, PRESENTED BY F. M. GREENE, CHAIRMAN, AND DISCUSSION THEREON

The Conference Committee on Laws and Regulations, having previously submitted a tentative report and having held open hearings on items included therein, now submits for the consideration and action of this National Conference, its final report.

1. *Peat Moss—Method of Sale.*

This item has been under study and consideration by the Conference for at least 6 years, and several recommendations have been adopted as to its method of sale. During the past year the Committee has received a recommendation from a State official that the Conference consider a requirement that peat moss be sold by net weight only. Once again the Committee has studied this matter, and it finds that there apparently is no panacea. Different types of products are sold as "peat moss," and many different packaging techniques are in use. It now is recommended that the Conference rescind all previous actions covering the method of sale of peat moss and adopt the following:

Peat moss shall be offered for sale or sold by volumetric measurement, in which case the volume shall be stated in cubic yards, cubic feet, or cubic inches, or by net weight, in which case the quantity shall be stated in avoirdupois pounds and ounces.

MR. R. E. MEEK: I am the weights and measures official who asked the Committee to consider the method of sale of peat moss. I do appreciate the fact the Committee has considered and made a recommendation. However, the recommendation does not, in my way of thinking, satisfactorily answer this difficult problem. I would like to point out that the sale of peat moss by dry measure in my State—a State among the ones that have abolished the use of "dry measures"—has been interpreted as being illegal.

I would like to point out there has been great progress made in the packaging of peat moss in smaller packages. Many of the smaller processors have come to a declaration of net weight. Some peat moss in large bales still is sold by cubic feet. I do not believe such volumetric measure tells the customer anything because it does not state the compression ratio. And even if it did, such compression ratio could not be verified.

I would like to ask this Conference to refer this matter back to the Committee for study during the coming year. In doing so, I would like to point out that the Federal Government now insists on the purchase of peat moss on the avoirdupois weight basis only. I feel that, in view of the good work this Conference has done over the years in trying to promote the sale of dry commodities by weight, this commodity too should be sold by weight.

(After considerable additional discussion, Item 1 of the Committee report was defeated by a standing vote. A subsequent motion to rerefer this matter to the Committee was adopted by the Conference.)

2. *Special Units for Fluid Dairy Products.*

Increasing pressure is being applied to State weights and measures officials to amend regulations or sponsor amendments to statutes to allow the sale of fluid dairy products in a size intermediate between the $\frac{1}{2}$ pint and pint. Such departure from the traditional binary submultiples of the gallon sizes for milk containers is desired by certain segments of the industry for varying reasons, including automatic-dispenser sales. The Committee has also had presented to it the need for a stipulation of units for packaged fluid dairy products of 1 fluid

ounce and less to be used in restaurants, airplanes, and the like, and ultimately perhaps to be sold through retail channels. The Committee has consulted with many weights and measures officials and with appropriate representatives of the dairy, bottle, and packaging industries and now offers the following recommendation:

Amend Section 27 of Form 2 of the Model State Law on Weights and Measures to include units of $\frac{1}{2}$ ounce, $\frac{3}{4}$ ounce, 1 ounce, and 12 ounces, all liquid measures, and thus make the section read as follows:

SEC. 27. FLUID MILK, SWEET AND SOUR CREAM, AND BUTTERMILK.—That fluid milk, sweet and sour cream, and buttermilk in package form shall be packaged only in units of $\frac{1}{2}$ ounce, $\frac{3}{4}$ ounce, 1 ounce, 1 gill, $\frac{1}{2}$ pint, 12 ounces, 1 pint, 1 quart, $\frac{1}{2}$ gallon, 1 gallon, or multiples of 1 gallon, liquid measure.

The Committee further recommends that this matter be referred to the Conference Committee on Specifications and Tolerances for appropriate action with respect to the Code for Milk Bottles.

MR. LEITHAUSER: Yesterday afternoon we had the discussion for quite some time by Dr. Campbell and Dr. Warne about standardization of packages. I think the Conference then should make up its mind whether they want standardization of packages or not. If we are going to have standardization of packages, I see no need for a 12-ounce milk bottle, the $\frac{1}{2}$ -ounce, the $\frac{3}{4}$ -ounce, or the 1-ounce. If the amendment were so changed as to exclude retail sales and allow only wholesale sales—that is, sales to restaurants or places of that kind—I could go along with it; but to break down our standards, when we are striving for standardization of packages, especially by permitting a 12-ounce bottle, I cannot go along with that.

MR. GREENE: As a point of information, the Committee did consider standardization of packages. That is why we specifically spelled out those sizes. As far as the wholesale vendor is concerned, we considered that also. We are faced in some areas with the sale of the small sizes in paper packages to people holding parties. The milkman either brings them, or the customer goes to a dairy store and buys a dozen $\frac{3}{4}$ -ounce packages of cream, or 2 dozen, or 4 dozen, depending on the size of the party; they take them home, put them in the refrigerator, and dispense them as used. That is why those small packages are recommended.

MR. COTTON: I am opposed to such sizes as $\frac{1}{2}$ -ounce, $\frac{3}{4}$ -ounce, and 1-ounce milk bottles. They are not milk bottles as such. This is food in packaged form and can be controlled under our usual procedure for food in package form.

MR. J. G. ROGERS: This is an issue that came into the industrial picture. I explained the reasons at the Committee hearing, and, for the benefit of those who did not attend that hearing, I think probably I might take the time of the Conference to cover just a few points here. This is a new development. It does not seem to affect the standardization law on milk bottles. These little containers that are comprehended in this industrial picture certainly should never be considered in the category of a milk bottle. What this is really is an item developed to facilitate the serving of cream for coffee when it is delivered at a restaurant or hotel or elsewhere. I cannot visualize it will ever be sold at retail level to any great extent. It is really sold at wholesale level and is put up by dairies. The dairies sell it to the hotels, restaurants, and other places where food and drinks are vended.

MR. ALLEN: I speak to you today as a consumer. Our company, as such, has no interest in this whatsoever. However, your Confer-

ence is trying to establish standard packages. You are trying to eliminate deceptive packages. When standards for milk were brought up originally, they went down to 1 gill. I am sure at that time probably nobody was selling below gills. That did seem to be a reasonable place to stop. Now you have quarts; half quarts, which are pints; half pints; and half of a half pint, a gill. That is as far as it goes at this time. Yet, there has developed a need for smaller containers for use in restaurants, air lines, and so forth. Why not go on down and permit a continued binary subdivision? In other words, have gills, 2-ounce, 1-ounce, and $\frac{1}{2}$ -ounce. If you keep dividing by two every time, you do not get into an intermediate or deceptive package. You go back to the original intent apparently when the thing was first worked out to have standard packages which were not deceptive.

MR. GREENE: Just as another point of information, the Committee has been corresponding all this year. If our recommendation is given back to the Committee for study, unless we get some different ideas or more support from the people who are opposing us when we come here, we will arrive next year with the same recommendation. There is nothing else we can do. We take the consensus of the letters we get in and of the people who attend the hearings. The Committee then arrives at a decision based on what we have heard, either through the mail or in person at the hearing. It is suggested that people who oppose this could have been helpful at the hearing.

MR. SAYBOLT: I am on the industrial side of this picture. In connection with the 12-ounce glass bottle size, our request for this was inspired not by any negative attitude toward competition, but by recognition of a competition which exists and which is real. There has grown in the last few years a rather sizable production of vending machines through which, among other products, milk is sold. Either at the instigation of the milk vending machine manufacturers or that of the dairy industry, there has developed, as an intermediate size, the $\frac{1}{3}$ -quart paper container; being a paper container, it frequently is exempted from the provisions of the standard-size milk bottle law. Thus the paper container manufacturers are privileged to enjoy the business of the milk vending machine, whereas the glass bottle industry is prohibited because of the wording of the weights and measures law.

I understand that the Vending Machine Association has made a very thorough survey and concluded that the great majority of the public buying milk through these vending machines want a volume of milk that is greater than $\frac{1}{2}$ pint but less than 1 pint. The committee proposal suggesting a 12-ounce package in glass would make possible a partial recovery from the unfortunate position in which the glass industry is placed.

As it stands today and as it will stand until the various States permit an intermediate size of glass bottle, the glass industry will suffer a penalty. I am sure that no weights and measures man in my wide acquaintance would ever wish to penalize any particular industry.

We have no quarrel with the container which is being marketed by the paper container industry through these vending machines. Our only desire is that, with your permission and your vote and the subsequent vote of the State Legislatures or the regulatory bodies, we have a size of glass bottle which would place us in a competitive

position. No one has been more enthusiastic than I, in my 39 years of association with you, to hew to the line of minimum packages and uniformity on a national basis; but times change, the world progresses. Here is a competitive condition in which the group that I represent is penalized.

MR. POWERS: I think everybody in this room realizes and knows fully well that we are going through a changing world. I dare say a great many men in this room remember when milk was dispensed in open containers and placed on the doorstep. A man put a dipper in, measured it out, and gave you a certain measure. We are in a changing world; and through the activities of weights and measures officials, we have more or less standardized the sizes of packages of certain commodities. I think this is very worthy of consideration at this Conference. It has been considered for quite a number of years that I have been coming to this Conference. I think it should be settled once and for all this year.

MR. LEITHAUSER: I should like to move that the Committee recommendation be amended to read:

SEC. 27. FLUID MILK, SWEET AND SOUR CREAM, AND BUTTERMILK.—That fluid milk, sweet and sour cream, and buttermilk in package form shall be packaged only in units of 1 gill, $\frac{1}{2}$ pint, 1 pint, 1 quart, $\frac{1}{2}$ gallon, 1 gallon or multiples of 1 gallon, liquid measure: *Provided*, That packages in units of less than 1 gill shall be permitted.

(Mr. Leithauser emphasized that the proposed amendment was not intended to exempt the smaller sizes of fluid dairy products from package marking requirements.)

(Item 2 of the Committee Report was thus amended by standing vote and, as amended, adopted by the Conference.)

3. Oleomargarine.

During the recent past there has been marketed oleomargarine in six $\frac{1}{8}$ -pound prints per one-pound package. Since the Model Law and numerous State statutes require that oleomargarine and margarine in package form be offered and exposed for sale and sold only in units of $\frac{1}{4}$ pound, $\frac{1}{2}$ pound, 1 pound, and multiples of 1 pound, avoirdupois weight, the question has been raised as to whether these $\frac{1}{8}$ -pound units are "packages." The Committee has been informed that both Federal agencies having immediate jurisdiction over such items of food—the Food and Drug Administration and the Department of Agriculture—have ruled that the $\frac{1}{8}$ -pound units are "individual packages" and are requiring complete labeling on each print. Such prints, if sold individually, would be sold in violation of the State statutes referred to above, but, on the other hand, they would not be in violation of Federal law. The Committee recommends that the Federal agencies reconsider their ruling in this regard and that, if such ruling is permitted to stand, the States also regard these "sticks" as "individual packages" and enforce strictly their statutes relating to the sale of oleomargarine and margarine. The Committee is of the opinion, however, that the packaged oleomargarine described above was not intended to be prohibited by Model Law language, and, to clarify that section of the Model Law in this respect, it is recommended that Section 26 be amended to read as follows:

SEC. 26. BUTTER, OLEOMARGARINE, AND MARGARINE.—That butter, oleomargarine, and margarine shall be offered and exposed for sale and sold by weight and only in units of $\frac{1}{4}$ pound, $\frac{1}{2}$ pound, 1 pound, or multiples of 1 pound, avoirdupois weight.

MR. BAUCOM: I rise to a point of inquiry. The Committee uses the word "unit." If margarine is put up four or six sticks in a 1-pound package, is the 1-pound package the unit we have reference to, or are the sticks the units?

MR. GREENE: The company that is marketing this oleomargarine is selling it in a 1-pound package that is labeled to show that the package is not to be opened before sale and that the $\frac{1}{8}$ -pound sticks

are not to be sold separately. Anybody that breaks the package in order to buy a stick would perpetrate a violation of the law.

MR. MCBRIDE: This amendment does not direct the packer what he shall do. It says what may be done. He may offer the quarter pounds, the pounds or multiples of pounds. He selects the method.

MR. BAUCOM: As I understand the Committee recommendation, we do not allow a retailer to open the 1-pound package and sell the sticks individually unless the sticks are of standard size and properly labeled.

MR. GREENE: I will read Section 26 as it now appears in the Model Law. You can compare it with the recommendation that we offer.

Section 26 as stated in the Model Law:

BUTTER, OLEOMARGARINE, AND MARGARINE.—That butter, oleomargarine, and margarine shall be offered and exposed for sale and sold by weight, and when in package form these commodities shall be packaged only in units of $\frac{1}{4}$ pound, $\frac{1}{2}$ pound, 1 pound, or multiples of 1 pound, avoirdupois weight.

MR. LEITHAUSER: I would like to point out that the Committee says: "Such prints, if sold individually, would be sold in violation of the State statutes referred to above, but, on the other hand, they would not be in violation of Federal law. The Committee recommends that the Federal agencies reconsider their ruling in this regard and that, if such ruling is permitted to stand, the States also regard these 'sticks' as 'individual packages'."

(Item 3 of the Committee Report was adopted by the Conference by a standing vote.)

4. *Barbecued Chickens—Method of Sale.*

The Committee has been informed of a growing trend to market cooked chickens on a "piece" basis rather than by net weight. Such selling method is in direct contradiction to Section 24 of the Model Law, which section requires that, except for immediate consumption on the premises where sold, all meat, meat products, fish, and poultry be offered or exposed for sale and sold on a basis of net weight. The Committee urges that all State and local weights and measures officials with such legal provisions in their statutes enforce them strictly and vigorously and that those without such provisions sponsor an amendment to the law that will include this provision.

(Item 4 of the Committee Report was adopted by the Conference.)

5. *Carry-out Meals—Method of Sale.*

The Committee recommends that carry-out meals that are not packaged in advance of order or sale be sold by menu and that such meals as are offered for sale in package form, as for example "TV Dinners," be labeled and sold by avoirdupois net weight of the total meal.

(Item 5 of the Committee Report was adopted by the Conference.)

6. *Stuffed Poultry—Method of Sale.*

In 1955 and again in 1957 the National Conference, on recommendation of the appropriate standing committee, adopted a recommendation that stuffed poultry, frozen, cooked, or uncooked, be sold and, if packaged, be labeled by the individual net weight of the poultry and the individual net weight of any stuffing. This matter has been rereferred to this Committee for further consideration. A study, including consultation with appropriate authorities, has been made, and the Committee now recommends that all previous actions of the National Conference with respect to this matter be rescinded and the following be adopted:

Stuffed poultry, whether frozen, uncooked, or cooked, shall be sold, whether or not it is in package form, by the avoirdupois net weight of the entire commodity, both fowl and stuffing, and shall be clearly represented as being stuffed.

(Item 6 of the Committee Report was adopted by the Conference by standing vote.)

7. *Pressed Logs—Method of Sale.*

The Committee has been asked to recommend a method of sale of "pressed logs (fire)" that are being marketed under various trade names and sold both by weight and by count. Since these are fuel, the Committee recommends that pressed fire logs, regardless of their composition, shall be sold by avoirdupois net weight.

(Item 7 of the Committee Report was adopted by the Conference.)

8. *Trading by Weight.*

During the 42d National Conference in 1957 Dr. W. A. Faught of the U. S. Department of Agriculture reported on the progress being made by the Department toward a transition in the trading in grains from the bushel unit to the hundredweight unit. Because of the optimistic character of Dr. Faught's presentation, this Committee assumed that, as the details could be worked out, the change would be placed into effect.

In February of this year the Committee had brought to its attention a news release in which the Department of Agriculture announced that this transition was being delayed for further study. This delay was effected following a hearing that had been called after certain strong pleas by relatively small segments of the grain industry that have opposed the change from the beginning. No official notice of this hearing was received by the National Conference on Weights and Measures or representatives of the Conference. This in spite of the fact that the Conference has from the beginning been one of the principal promoters of the plan that has as its single purpose a system of grain trading that will be uniform and uniformly interpreted by all.

As a result of the foregoing, the Chairman of the Conference Committee on Laws and Regulations immediately established a Subcommittee on Trading by Weight and charged that subcommittee with the responsibility of pursuing the changeover. This subcommittee was made up of George Johnson of Kentucky, Chairman, Nalls Berryman of Florida, Ralph Magoffin of South Carolina, J. Fred True of Kansas, and Robert Williams of Nassau County, New York.

The Committee on Laws and Regulations, proceeding on the basis of the study of its Subcommittee on Trading by Weight, now urges that this 43d National Conference recommend officially and strongly that the U. S. Department of Agriculture proceed immediately with the plan for the changeover in the unit of trading in grains as the Conference had assumed it would do, and that the Conference offer its assistance in any way that will expedite the change.

The Committee further recommends that the President of the National Conference on Weights and Measures establish a study committee to consider and develop ways and means to expedite the transition, and that he invite representatives of the U. S. Department of Agriculture, the several national organizations interested in grain trading, selected farm organizations, and others as appropriate, to associate themselves with the committee and aid in its studies. It is suggested that the study committee be named the Committee on Trading in Grains by Weight and that it report back to the 44th National Conference in 1959 on the progress that has been made.

(Item 8 of the Committee Report was adopted by the Conference.)

MR. HANSEN: In the first place, this transition is not opposed by a small segment of the grain industry. I represent the largest cash grain market in the world. The present Committee has not heard anyone on this matter who comes from the area where a great proportion of the grain is grown and sold and marketed. I could remember many reasons why this Conference should be opposed to it.

I do not know why the Conference even considers a matter like this, because the bushel has only one purpose—that is to measure grain. You do not have to sit and study this matter like we have for 30 years. Just have the Federal Government abolish the term "bushel" as its unit volume; that is all there is to it. If they want to abolish that, it can be done. It is going to be opposed very, very definitely.

The term "bushel," as it is used in the grain trade only, is important in the analysis of the grain to determine what its value is. The grain is weighed from the time it is brought to market. We have

more large accurate scales to weigh grain in our part of the country than I think any place else in the world. The grain is weighed, not in small sackfuls on portable scales, but farmers own transports that haul 40,000 pounds of grain in from their own farm to market. The grain is weighed from the time it comes to market until it gets into flour. It is then again weighed.

MR. GREENE: The Committee includes in this report its expression of appreciation to all who have brought to it recommendations and suggestions and to all who have given it counsel, either written or oral.

(The report of the Committee on Laws and Regulations, as amended, was adopted by the Conference.)

THE METRIC SYSTEM OF WEIGHTS AND MEASURES

By J. T. JOHNSON, *President, The Metric Association, Inc., Claremont, California*

It is a well known fact that before man had any number system he used his fingers for tallying. Later, after number names had been invented, tallying evolved into counting. As tallying had been carried on with the ten fingers, counting, naturally, developed into a decimal system.

When the first need for measuring arose, again parts of the body were pressed into use. The length of the forearm, the span, the hand, the finger, the King's arm, the fathom, a man's girth, the foot, the pace, and the rod—all based on the human body—were used as measures. But here we were not so fortunate as in the development of counting for the reason that, although man had ten fingers which was exactly 10 in every man, every man's arms, hands, and feet were not always of the same length.

This interesting but stubborn fact led to two lines of development—counting and measuring. Counting soon developed into computation, and thus was able to progress unimpeded, and has gone on apace ever since. But measuring soon struck a snag. Whereas 10, 100, and 1000 is the same to every man, a man's foot did not mean the same thing to the people in different towns and countries. There were at one time more than 280 different kinds of measuring feet in Europe. This, no doubt, caused a lot of unrest among thinking minds.

Gabriel Mouton (1618–1694), Vicar of St. Paul's Church, Lyons, France, was one of the first men to propose a comprehensive decimal system for measuring, having as a basis the length of an arc of one minute of a great circle of the earth.

Talleyrand (1754–1838), Bishop of Autun, Paris, in April 1790, suggested to the National Assembly of Paris a plan of using as a unit of measure the seconds pendulum. This had to be discarded because of the fact that a seconds pendulum would not be uniform in length at different altitudes above sea level.

As trade and commerce developed in Europe, the fact that each country and even city and municipality had its own measuring foot and pound became a direct hindrance to further commercial expansion and great confusion resulted.

Later, in 1790, the King of France called a meeting to which he invited delegates from the different countries for the purpose of organizing a new system of measurement. There was much debate on this, the debate lasting more than a year. In March 1791, a com-

mittee of the French Academy of Science presented a report to that body recommending that the length of a quadrant of the earth's circumference measured along a meridian be taken as the basis for the new standard and that one ten-millionth of it be the new unit of length. The plan provided further for the measurement of an arc of a meridian from Dunkirk on the northern coast of France to Barcelona on the southern coast of Spain. These cities offered the greatest overland distance on a meridian in Europe—about $9^{\circ}30'$ —and it extended on each side of latitude 45° .

On June 10, 1792, the King of France entrusted two engineers, DeLambre and Mechain, to do the surveying. On May 29, 1793, in the finished report of the National Academy the name *metre* (meter) was given to the ten-millionth part of the quadrant of the earth's meridian. After considerable embarrassment and difficulty with the inhabitants of the country surveyed, due to the Revolution, the two brave engineers completed their survey in 1798. It was checked and found to be correct to a remarkable degree of accuracy. On June 22, 1799, a platinum meter bar was adopted as the true meter and deposited in an underground vault in the Archives of the State near Sevres, a suburb of Paris. It is known as the meter of the archives. Thus it took seven years to complete and check this survey. One of the engineers lost his life from exposure on the mountainside where he slept at night. It may seem like a rather naive procedure to us now to have spent seven years in establishing the length of the meter when any convenient length could have been chosen. The yard of England, we say, could have been chosen just as well and made into a standard as it was in England. In another sense it creates a certain respect for the meter in that it is based upon Mother Earth and in that it did take seven years to make the first meter bar. Who knows, it may be fortunate, indeed, to have the unit of length based upon the earth's circumference. Our confusion in miles—with the land mile, the nautical mile, the statute mile, and the geographical mile—could be perhaps avoided if we had but one mile based upon the earth's circumference as is the nautical mile. It is an interesting fact, and it should be mentioned here, that if the right angle were given 100 degrees as it was at one time in France, and each degree given 100 minutes, then the kilometer would be the length of one minute of an arc of a meridian, and it would be the true nautical mile.

After the date 1799, which is considered as the birth date of the metric system, the following dates are important in metric development.

In 1840 the metric system was made compulsory in France. In 1866 its use was made permissible in the United States. In 1870 the first Metric Conference was held in Paris, as a result of which prototype meters and kilograms were made for different countries. The United States was represented at this first conference. In 1875 a permanent International Bureau of Weights and Measures was established on a plot of ground in the park of St. Cloud just outside Paris. This was declared neutral territory. The United States is a member of this Bureau and sends delegates to its biennial meetings, the last one being held in October of 1956.

In 1876 United States coinage was put on a metric basis. In 1878 the United States Navy Department adopted the metric system for

exclusive use in its medical department. In 1890 the United States received its phototype meter No. 27 and prototype kilogram No. 20. In 1893 the meter was made the standard of length by act of Congress and the yard was defined as 3600/3937 of the meter. In 1894 the War Department of the United States adopted the metric system for its medical work. In the same year it was adopted for all electrical work. In 1902 the United States health service took it up. In 1909 the Philippine Islands legalized it. In 1922 the Amateur Athletic Association adopted it. In 1944 the Council on Chemistry and Pharmacy of the American Medical Association adopted its exclusive use, leading to the rewriting of the U. S. Pharmacopoeia in metric terms. In 1946 the State Department of the United States Government recommended the use of the metric system exclusively in international aviation. The immediate outcome of this was that the nautical mile was to be used for long distances and the knot for aircraft and wind speed, with the remaining quantities in metric units.

In the January SAE Journal for 1948 on pages 47-49 is found the following:

DECIMAL DIMENSIONING CONVERSION

Painless for Aeronautic Industry

Based on a paper by O. E. Kirchner, Director of Engineering, American Airlines, Incorporated, and Chairman of SAE Committee, S-1, Aeronautical Drafting Manual.

Adoption of decimal in place of fractional dimensions meets with little employee and vendor resistance and creates no transitional snarls. This was the consensus of opinion of 75% of the aeronautic industry, now using decimal dimensioning, in a recently-conducted survey.

In every case engineering department personnel were 100% for the change while at least 90% of those in the shop favored it. Others showed some resistance but accepted it gradually.

47 Decimal Dimensioning Users

Survey on the use of decimal dimensioning in the aeronautic industry by the SAE Aeronautical Drafting Manual Committee disclosed the following companies as users of decimal dimensions. If any other company contemplates conversion to the SAE decimal system, undoubtedly any one of these manufacturers will answer any questions.

Then follows the list of 47. Some of the most well-known only will be given here: Boeing Aircraft Company, Columbia Aircraft Corporation, Consolidated-Vultee Aircraft Corporation, Curtiss-Wright Corporation both Airplane and Propeller Divisions, Eastern Airlines, Incorporated, Lockheed Aircraft Corporation, National Airlines, Incorporated, Northeast Airlines, Incorporated, Republic Aviation Corporation, Transcontinental and Western Air, Incorporated, Western Airlines, Incorporated, and Wright Aeronautical Corporation.

This trend toward decimalization can mean only that decimalization is desirable. If decimalization is desirable, the metric system which is wholly decimal should be the solution.

Thus, progress in metric usage in this country is making headway, but very slowly, too slowly in comparison to what it could and should do. I have traced its progress only in the United States, letting figure 1 show in condensed form the progress made in the remainder of the world.

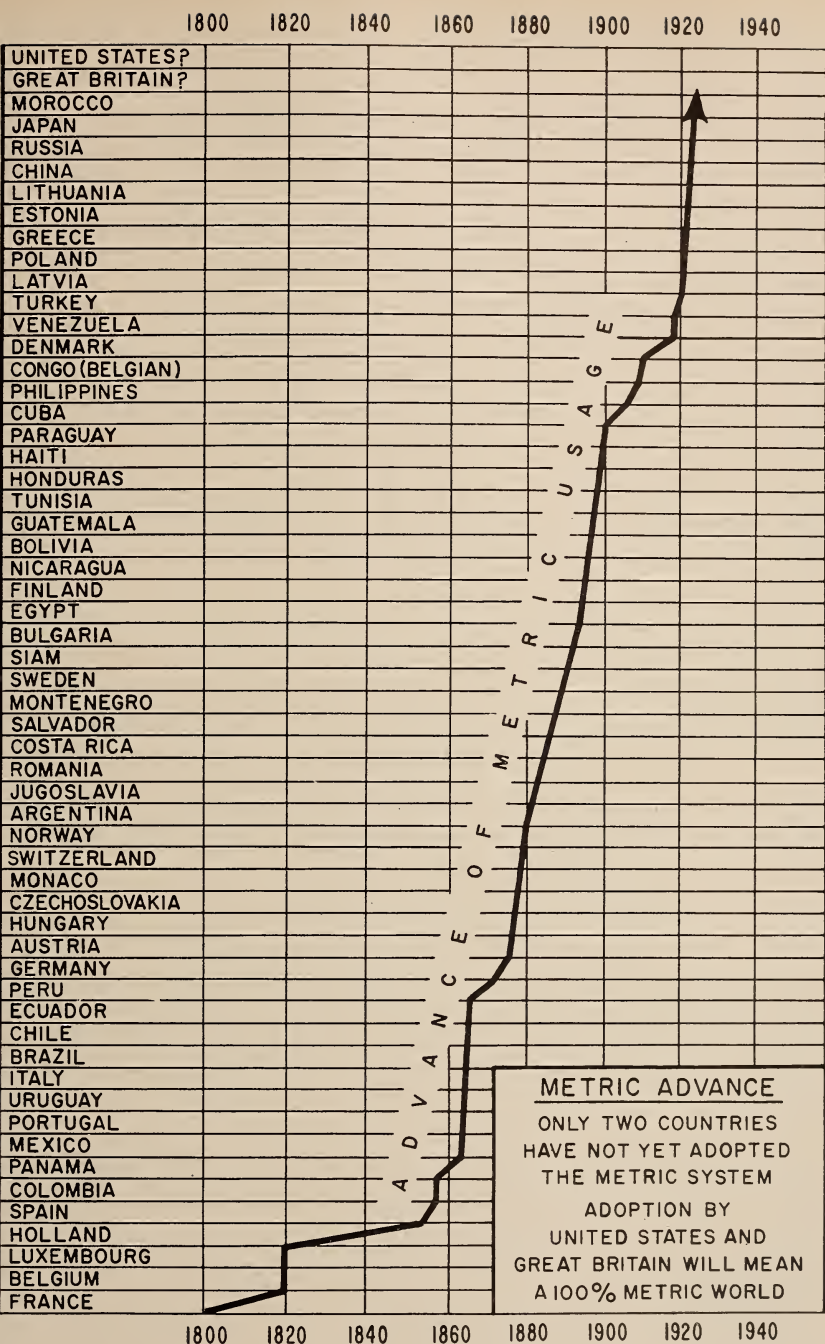


FIGURE 1. Metric system advance.

It is interesting to note in this connection, however, how major wars have affected progress in the metric movement. It was inaugurated in France in 1799, right after the French Revolution. Its use was made permissive in this country after agitation in 1866 right after the Civil War. After the Prussian Wars in Europe, in 1871, Germany, Austria, Hungary, and their dependent States adopted the metric system and thus almost doubled the then metric population. In 1920-21, after World War I, its use was made official in the countries of Russia, Japan, China, and Turkey. That more than doubled the metric population at that time, so that now 55 of the 57 principal countries of the world are on a metric basis and more than 85 percent of the world's people are using it.

We are recovering from another World War and, judging by the letters and inquiries that are coming in, agitation for metric reform is being felt on many sides. It is hoped that in the near future some real metric progress will be realized in this country, which is so close geographically to its South American metric neighbor.

Wars hasten trends and precipitate change. It is as if a huge sifting tray is being shaken, bringing the big things (trends) to the top. The metric usage is truly a trend. It is not a fad. Fads come and go, but trends are a part of natural evolution and move slowly except when major crises such as world wars shake the historical sifting tray and bring the big things to the top.

If anything can be predicted from this trend graph and its relation to major wars, it is that, as soon as this cold war which is the aftermath of World War II is settled and resolved and peace activities are begun, there will be a definite action metricwise. This activity has already made a beginning in that Eli Lilly and Company, one of the world's large pharmaceutical manufacturing organizations at Indianapolis, Indiana, has, in December 1956, gone to complete metric adoption in its trade and manufacturing without any government legislation or compulsion but from their own initiative. What they have done other organizations will do.

This is a landmark in the history of the metric system. Why do we call it a landmark? Because now we need no longer debate about whether the metric system should be adopted or not. Our concern now is what is the best method of adopting it? How much time do we need? What is the most economic way of making the conversion? The speaker from Eli Lilly presently will tell us how they did it.

For the benefit of those who may not be so familiar with the metric system and may think of it as a foreign system because it originated in France, a brief statement of its advantages may be appropriate here. There must be something inherently more simple and more desirable in the metric system than in the English system or the steady trend in metric usage would be checked here and there. No nation has ever turned back after once having adopted the metric system. That alone should be sufficient argument for this country and England to cause them to take a serious attitude toward the metric question.

Briefly, the advantages of the metric system are three. They are as follows:

1. *Simplicity*.—When we compare some 53 concepts and terms in our English system of weights and measures, with which we are supposed to be familiar, with the three simple terms, meter, liter, and gram, which constitute the metric system, this advantage is at once evident.

The following six statements comprise the commonly used units of the metric system:

For Length

10 millimeters (mm)	= 1 centimeter (cm)
100 centimeters (cm)	= 1 meter (m)
1000 meters (m)	= 1 kilometer (km)

For Capacity

1000 milliliters (ml)	= 1 liter (l)
or 1000 cubic centimeters (cm ³)	= 1 liter (l)

For Weight

1000 grams (g)	= 1 kilogram (kg)
1000 kilograms (kg)	= 1 metric ton (t)

No other units are required for the layman in his expressions of metric quantities.

The whole metric system can be seen and envisaged from the meter stick.

2. *The One-To-One Correspondence Between The Metric System Units of Length, Capacity, and Weight.*—One cubic centimeter of water has *one* centimeter for its cubic dimension and weighs *one* gram. There is no such correspondence in the English system. One cubic foot of water weighs approximately 62½ pounds. This correspondence effects a tremendous simplicity in computation.

3. *Decimal Division of its Units.*—This is by far the greatest advantage the metric system has over the English. Such an advantage has already been adopted in that mechanics have decimalized the inch, engineering has decimalized the foot, and aviation has decimalized the mile. But this partial implementation has reaped only a part of the full benefit of decimal division and decimal relation of units throughout and has served at best only as a hybrid of the full advantage of decimalization. Such action has only postponed the total adoption of metrics and thus has caused a continuance of the use of the inch, foot, and mile with their nondecimal interrelations.

A final comment should be added in that French, German, and Russian children use the metric method and thus, it seems to me, they have an unfair advantage over children in this country.

THE BIG CHANGE TO THE METRIC SYSTEM

By E. V. MEITH, *Eli Lilly and Company, Indianapolis, Indiana*

The title which I have chosen for this paper is not intended to provoke sympathy for our work at Lilly's, but rather to encompass the number of problems faced in the conversion of a large manufacturing concern from the avoirdupois to the metric system of weights and measures. Actually, this change affects much more than just weights and measures.

Several times in years past, the proposition of changing all plant operations to the metric system has been suggested and then dropped after a cursory study of problems to be faced and estimated costs involved.

Early in the 1940's, our company undertook an extensive study to determine, as far as possible, what would be required to convert all internal operations to the metric system. This study covered not only the estimated cost of such an undertaking, but also consideration of the organization and the effects of such a program on the people involved.

With the advent of the new so-called "Wonder Drugs" during the late 1940's and early 1950's, it became commonplace to express dos-

ages in metric units. This practice came about mainly because of the need of exceedingly precise determinations of quantities involved both from safety and financial standpoints.

The entire research function of our company has always been closely associated with the metric system, as have practically all scientific processes the world over. Practically all of the chemist's glassware is graduated in metric units, his scales and fine balances are traditionally metric. So, the basis for the continued growth and future expansion of Eli Lilly & Company is, and has been for years, dominated by metric units.

To help bridge the gap between research and development and actual production, pilot plants were established several years ago. These pilot plants could take a newly developed item from our research division and plan and produce a pilot lot of finished material greater than was possible in a researcher's laboratory, but smaller than would be practicable in a full production department. It was a perfectly natural development that, to a great extent, the pilot plant should use many metric measurements as they were used by the research chemist. What more natural, then, than the metric units following the line on to production departments?

One large, central stores department dispenses the various ingredients which go to make up any particular product. These ingredients, whether they be powders, oils, solids, or coloring materials are weighed or measured to a specific amount, labeled and checked, and sent on to whichever production department is indicated. It was decided that this central stores section would be the first department to be completely converted to metric units.

On one Saturday and Sunday we completed the conversion of this one department. Some new scales had been purchased for this installation, beams and counterpoise weights were changed, metric dials substituted, and avoirdupois counterpoise weights for equal-arm balances were replaced. All liquid measures for dispensing oils and other fluid items had to be either recalibrated or replaced. I think that everyone connected with the metric conversion felt a great sense of relief when this first big changeover had been completed.

Our next step was to take the various production departments, one by one, and convert all weighing and measuring equipment in each department over a single weekend. This, of course, was not always possible, but once a departmental conversion was started, we stayed with it until it was finished before starting on another department.

The Chemical Manufacturing and the Liquid Section, where Elixirs, Fluid Extracts, Tinctures, etc. are made, contain a tremendous number of tanks, stills, percolation equipments, and many different capacities of smaller pots, buckets, and other liquid containers. The majority of all these containers have gage sticks which were calibrated with a standard meter. All of these gage sticks had to be recalibrated in liter units, which was perhaps the most tedious part of our entire conversion program.

While figures, arithmetically speaking, are usually rather dull, I would like to quote a few. Out of nearly 900 scales and balances, we have so far converted approximately 250 to the metric system. The majority of the others were already metric. Gage sticks and calibrated containers numbered around 600. There were also some 6 or 8 liquid meters.

The Commissioner of the Federal Narcotics Bureau was very enthusiastic over our metric change. All necessary records, requisition forms, etc., bear only metric units. However, overtures to the Alcohol and Tobacco Tax Unit to permit us to handle grain alcohol in liters met with no enthusiasm. Consequently, because of government regulations, it will be necessary to maintain grain alcohol in U. S. volumetric units.

While the changing and recalibrating of scales, balances, gages, and various containers was a tremendous undertaking, other sections of the company were actively involved in the big change.

Before any actual conversions were made, our Purchasing Division began contacting various suppliers in regard to packaging raw materials in metric amounts. For the most part, we received marvelous cooperation from these outside agencies. Some even went so far as to begin preparation of two complete price lists, one metric and the other avoirdupois. One slight misunderstanding did develop, however. After using the metric signs for a short time, our Purchasing Department forwarded an order for salt to a supplier. A letter was returned rather quickly informing us that our order could not be filled; because the salt was not available in KEGS. As it turned out, the order actually called for so many kgs of salt. I will say that we received excellent cooperation from the various scale, balance, and meter companies who were involved in this conversion.

Our records section and cost accounting departments put in many, many a long hour of extra work because of the metric changeover. All prices and costs had to be changed from dollars and cents per pound to dollars and cents per kilo. Running inventories of raw and finished materials had to be converted. However, everyone agrees that record keeping is greatly simplified by the use of the metric system.

Considerable groundwork was laid in the field of acquainting our personnel with the metric system before we actually began our conversion. Information sessions were held in various departments and numbers of conversion charts distributed to demonstrate the relative sizes of ounces and grams—pounds and kilos—and gallons and liters. The Formula Control Department has in its care approximately 2,500 master formulas for various finished and intermediate products which we manufacture. When need for a certain item arises, the Formula Control Department issues a blue-printed copy of the necessary formula. This copy is stamped with an identifying Lot Number, which is carried through the entire manufacturing process for Identity Control procedure. The formula ticket lists all ingredients in specified amounts, and step-by-step production methods. It was long recognized that changing the weighed and measured amounts on all of the Formula tickets to metric units would be one of the biggest jobs in our conversion program. Some two years before any actual conversion work on weighing equipment was scheduled, the personnel of the Formula Control Department began writing in metric equivalents for each item on every formula. In this way, people in the manufacturing areas were able to become accustomed to seeing weights and measures written in gram, kilo, and liter units. Gradually, as scales were converted to the metric system in each department, the avoirdupois figures were dropped from the formula tickets.

We feel that this procedure gave our people a pretty good basic knowledge of the metric system before it was adopted.

The longer the metric system is in general use, the more familiar non-scientifically-trained people become accustomed to metric units, and the happier everyone becomes with the metric system.

Although we are not 100 percent on the metric system today, I feel that we are rapidly approaching that point. Several of us at Lilly's have had the dream of using a single weights and measures system for many years, and we are extremely gratified to have had an active part in the conversion, as far as it has gone, to the metric system. We feel that "The Big Change to the Metric System" is a giant step toward work simplification and broader understanding throughout the world.

REPORT FROM NATIONAL SCALE MEN'S ASSOCIATION

By H. J. FULLER, *President, NSMA, and President, H. J. Fuller Company, Columbus, Ohio*

I consider it an honor and a privilege to speak before the National Conference on Weights and Measures. For many years I have attended your National Conference meetings, as well as many State meetings. I have noted with keen interest the energy and effort expended by the officers and committeemen to make these meetings constructive and educational and worthwhile to all weights and measures men of this country. The officers, committees, and members who steer this fine organization deserve much credit. The results of their efforts are very much in evidence by their many accomplishments.

On behalf of the National Scale Men's Association, I wish to thank the National Conference on Weights and Measures for inviting its President to appear on this program, to report on NSMA activities.

The National Scale Men's Association was started in or about the year 1913 by a small group of men who called themselves "Scale Experts." These men realized the importance of meeting together to discuss their scale and weighing problems. Today this organization, started by a few men in a spirit of cooperation to share with and learn from each other, has grown to a membership of over 700, extending from coast to coast and Florida to Canada. There are now 16 local divisions.

While the membership of NSMA has expanded rapidly in the past few years, it is still a long way from its rightful membership potential. Today there is a greater need than ever before for scale men to meet together to discuss scales and weighing problems. Scales and weighing applications are changing complexions so fast that those who are close to them find them difficult to keep currently informed. The most practical way for all interested in scales and weighing to keep informed and to work in harmony with each other is for all to meet on common ground through the medium of NSMA. This organization constitutes a forum in which all weighing problems can be discussed and analyzed from each standpoint. In NSMA we have the union of all parties affected by weighing.

Most of the local divisions hold four regular meetings a year. These meetings are designed to be educational and informative. The NSMA

national conferences are held annually. Many who have attended these conferences through the years state that the programs presented at these conferences are of the highest caliber.

One only needs to read the roster of past officers of this association to realize the dedicated leadership the National Scale Men's Association has had in the past. I shall endeavor to the best of my ability to continue the forward movement of this Association. As President of NSMA I extend to each of you who are not already members an invitation to join the NSMA and get better acquainted with the men of our profession.

In closing, I wish to quote from a message written by our recent past president, Oliver H. Watson, which was published in the March 1957 issue of the Scale Journal: "We who serve the National Scale Men's Association as officers do so because we want to improve the policies and practices of the association and of scale men, and secure for our craft its rightful place in national esteem. We want the scale men to deserve and receive universal respect and to be compensated in accordance with the value of their service. Any amount of effort directed toward these ends seems to be rewarding effort."

REPORT OF THE EXECUTIVE COMMITTEE, PRESENTED BY J. P. McBRIDE, CHAIRMAN

1. NATIONAL WEIGHTS AND MEASURES PUBLICATIONS.—In response to a request that the Executive Committee consider the matter of a National Weights and Measures publication, the Chairman wrote to 70 weights and measures officials asking for their opinions on this matter. Approximately 30 replies were received; practically all of these indicated the desirability of such a publication. Several of those replying expressed an appreciation of the problem presented by the mechanics of putting such a plan into operation. There was also noted in some of the replies the information contained in the existing State and regional news letters.

This matter was discussed during the open meeting of the Executive Committee. It was generally conceded that there is available in the publications of the National Bureau of Standards the necessary fundamental information in the weights and measures field. The need lies in presenting current information on immediate problems and suggested solutions for these.

After deliberations the Committee agreed that there is a need for a national publication, but, because of the mechanical difficulties involved, it felt that more study is needed. Since this matter properly falls within the area of the Conference Committee on Education, the Executive Committee recommends that the topic be referred to the Conference Committee on Education for a thorough evaluation and subsequent report to the National Conference.

The Executive Committee was informed by the Editor of the Scale Journal that, as an interim expedient, the Scale Journal would be willing to devote some one to two pages representing from 1,500 to 3,000 words each issue for properly edited weights and measures items. The Committee acknowledges this offer and expresses its appreciation to the Editor of the Scale Journal.

2. WEIGHTS OF PACKAGED FLOUR.—The flour milling industry submitted to the Executive Committee an explanation of the difficulties of industry in conforming to the adopted procedure of

this Conference as recommended in 1955 by the Special Flour Committee. By way of remedy the industry suggested the possibility that flour packages have their statements of quantity qualified by a statement of moisture content at time of packing. During the discussion as to what standard moisture content might be agreed upon, industry representatives offered, variously, 14 percent and 13.5 percent. The Conference President suggested a second study committee of 5 members of this Conference to be appointed by the President with the Conference Secretary to be designated as consultant and nonvoting secretary to the Committee, and that this Committee be directed to solicit the cooperation of several interested groups.

The Executive Committee is amenable to this suggestion of the Conference President. However, the Committee desires that the record be clear with respect to the 1955 action of the National Conference that resulted from an exhaustive study in an honest attempt to devise a solution to the problem by the Special Flour Committee. The Executive Committee emphasizes that its present recommendation is in no way intended to weaken that action of the National Conference on Weights and Measures.

In line with the suggestion of the Conference President, the Executive Committee recommends that the President appoint a special committee, for a term not to exceed two years, to further study the packaged flour situation and report its findings to the Conference. It is recommended that (1) the membership of such a committee comprise five weights and measures officials; (2) the Conference Secretary be designated as consultant and nonvoting secretary to the committee; (3) the special committee be directed to solicit the cooperation and technical consultation of the Association of Food and Drug Officials of the United States, the Federal Food and Drug Administration, the National Bureau of Standards, and others as appropriate; and (4) the committee be further directed to confer freely with representatives of millers and distributors of flour and with consumers.

The Executive Committee acknowledges, with gratitude, the response to its communications and the excellent participation during its open hearing.

(The report of the Executive Committee was adopted by the Conference.)

AFTERNOON OF WEDNESDAY, JUNE 11, 1958

—NO BUSINESS SESSION—

Tours of the Food and Drug Laboratories of the Federal Food and Drug Administration and of the laboratories of the National Bureau of Standards were conducted during the afternoon for many of the delegates of the Conference. A visit was made to the Agricultural Experiment Station, U. S. Department of Agriculture, Beltsville, Maryland, by a special group of officials to discuss the measurement of moisture in grains.

FOURTH SESSION—MORNING OF THURSDAY, JUNE 12, 1958

(R. W. SEARLES, VICE CHAIRMAN, PRESIDING)

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY J. E. BRENTON, CHAIRMAN, AND DISCUSSION THEREON

The Committee on Specifications and Tolerances presents, for your consideration and action, this final report. The report includes all matters referred to the Committee since the 42d National Conference on Weights and Measures and other matters that have been developed at the Committee's initiative.

Because of the relatively few items before the Committee, it was deemed unnecessary to hold an interim meeting. Consultation among Committee members and between the Committee and weights and measures officials, industry representatives, and others, has been carried on by correspondence. Committee recommendations were developed after the open meeting on Monday, June 9, 1958.

Presented below are the specific items that have been considered by the Committee, grouped under appropriate code headings as found in Handbook 44—2d Edition, as amended through the 42d National Conference, including the Committee's recommendation in each instance.

GENERAL CODE

To permit utilization of a design change in the means for reading the indications of weight and money values, employing color separation to produce a novel indicator with zero width, as has been demonstrated to the Committee in a sample of a new line of computing and prepackaging scales, the Committee recommends that general specification G-S.5.3.3. WIDTH [of indicators] be amended by deleting clause (a), "(a) not less than the width of the narrowest graduation," and, as necessitated by this deletion, rewording the paragraph to read:

G-S. 5. 3. 3. WIDTH.—The width of the index of an indicator in relation to the series of graduations with which it is used shall be not greater than (a) the width of the widest graduation, (b) the width of the minimum clear interval between quantity graduations, and (c) not greater than three-fourths of the width of the minimum clear interval between money-value graduations.

Because of the increase in the commercial use of large measuring equipment, the Committee has considered whether the weights and measures official should have available with respect to measuring devices the same legal grounds as are now provided with respect to scales, for requiring "accessibility for testing purposes" and "assistance in testing operations." This matter was discussed thoroughly during the open meeting and the Committee feels that it warrants serious consideration. Accordingly, the Committee will place the matter on its agenda for study during the ensuing year.

SCALE CODE

The 42d National Conference, in 1957, adopted amendments to the Scale Code by adding regulation paragraphs R.4.7. [under R.4. VALUE OF MINIMUM GRADUATED INTERVAL] ON LARGE-CAPACITY SCALES OTHER THAN LIVESTOCK, ANIMAL, VEHICLE, WHEEL-LOAD, AXLE-LOAD, HAND-OPERATED GRAIN HOPPER, AND CRANE SCALES, and R.4.7.1. WEIGHBEAM TYPE, and R.4.7.2. AUTOMATIC-INDICATING TYPE.

During the time that this amendment was before the Conference, a representative of a scale manufacturer proposed that the Conference consider modifying these amendments. As a result, the Committee Chairman suggested that the scale industry submit, in formal terms, prior to the 43d National Conference, any amendments to these paragraphs that they felt appropriate. Weights and measures officials and users of such large-capacity scales were urged by the Committee in the tentative report to study Scale Code paragraphs R.4.7., R.4.7.1., and R.4.7.2., and submit to the Committee Secretary any comments and suggestions for improvement that they might have with regard to these paragraphs as they now stand. No such comments or suggestions were received.

The Committee Secretary has just received final correspondence from the Scale Manufacturers Association. This was made available to Committee members after arrival in Washington. Owing to the fact that some ambiguities continue to exist in this area, the Committee does not feel that proper final conclusions have been reached that would result in any appreciable improvement in the language now existing in these regulations. Furthermore, the Committee does not believe that any urgency for action exists and does believe that hasty action would be inappropriate.

Although the Committee recommends that no action be taken on this matter by this Conference, we are cognizant and sincerely appreciative of the assistance and data furnished by the Scale Manufacturers Association—data that will serve as a valuable reference in our evaluation of the suggestions that have been submitted as being relevant to this subject matter concerning the value of minimum graduated interval on commercial scales of the several types in question.

The scale industry and the members of this Conference have the assurance of this Committee that provisions of a definite nature will be submitted for your consideration prior to the 44th National Conference on Weights and Measures.

The Committee considers it appropriate at this time to call to the attention of the Conference the following changes with respect to uncompensated spring scales that, by prior action of the Conference, will become effective on July 1, 1958:

Delete definition D.10. "SPRING SCALE."

Delete the words "uncompensated spring scales" from the side title and from the text of tolerance paragraph T.1.3.1. and from the title of table 6.

Delete tolerance paragraph T.1.3.2. and table 7.

In tolerance paragraph T.1.3.3. and in the title of the following table, change "table 8" to read "table 7".

In tolerance paragraph T.2.3.1. and in the title of the following table, change "table 9" to read "table 8".

Delete regulation R.5.

In relation to the foregoing, the Committee reminds the Conference that these changes do not of themselves specifically "outlaw" uncompensated spring scales; such scales are, after July 1, 1958, merely subjected to the same performance requirements as other scales.

MR. J. T. KENNEDY: Does this mean that all uncompensated spring scales now in use are to be prohibited from use after July 1?

MR. BRENTON: It is my opinion that after July 1, 1958, all so-called uncompensated spring scales being used commercially will be subject to the tolerances as prescribed, which will be Table 6.

MR. KENNEDY: The District of Columbia cannot condemn the uncompensated spring scales that are now in use. If the Conference will make these changes nonretroactive, we can abide by them and approve only compensated spring scales in the future.

MR. BRENTON: Mr. Kennedy, please disregard the use of the phrase "uncompensated spring scales." It is my interpretation and opinion that it is not a question of whether a scale is compensated or uncompensated; it is a matter of whether or not the scale conforms to the tolerances that are applicable as of July 1.

MR. KENNEDY: On June 28, we will say, a man has an uncompensated spring scale approved under the more liberal tolerances then applicable. Three days later that scale cannot be approved and cannot then be used commercially. It would be better if this were made nonretroactive.

MR. BRENTON: Perhaps a little clarification might assist at the present time. I want to remind you again that this is not something we are recommending at this time. It is simply a reminder of something you approved in 1955 and postponed for one year at the 42d National Conference last year.

LIQUID-MEASURING DEVICE CODE

The Southern Weights and Measures Association, during its annual meeting in Louisville, Kentucky, October 1957, adopted the following recommendation to the National Conference:

Whereas the modern liquid-measuring device is so designed as to provide for a full and accurate delivery at all times, there is no need for additional "lapse time" tolerances. We, therefore, recommend that all of Section D. 12., D. 13., and N. 1. 4., and the phrase "except elapsed time (test)" in T. 1. and all of Section T. 2. be repealed and deleted from the code of Handbook 44—2d Edition.

The Committee has looked into this recommendation quite thoroughly, as have the representatives of manufacturers and users of wholesale and retail liquid-measuring devices. The expansion and contraction of petroleum products under certain temperature changes that may and frequently do occur in the course of the commercial operation of liquid-measuring devices will alone result in errors in excess of the prescribed tolerances for such devices. Therefore, were it not for the provision, now in the code, for the "correction" of observed errors, if necessary, on elapsed-time tests, devices might be found to be "out of tolerance" through no fault of the device but solely because of volume changes of the product in the device as a result of unavoidable changes of temperature. It is the consensus, therefore, that the paragraphs referring to elapsed time tests should not be deleted. However, as expressed during the open Committee meeting which was held in the Franklin Room during the afternoon of Monday, June 9, it is the opinion of the Committee that a tolerance was never intended, and should never be utilized, for the purpose of legalizing and permitting the use of a mechanically defective weighing or measuring device. The necessity of allowing a tolerance of 2 cubic inches per hour in connection with the elapsed time test was also questioned.

With specific reference to the necessity of allowing a tolerance of 2 cubic inches per hour in connection with the elapsed time test, the representatives of the gasoline pump manufacturing industry have volunteered their cooperation in assisting the Specifications and

Tolerances Committee in obtaining accurate data concerning the tolerance that may be required in connection with this particular test.

The elapsed time test is not a closed issue. It will receive careful study between now and the 44th National Conference on Weights and Measures. As an important part of this service, your Committee solicits the assistance of all weights and measures officials, manufacturers, and users of liquid-measuring devices in order that it may have the benefit of their knowledge and experience in connection with this important subject.

It is the unanimous opinion of the Committee that the Southern Weights and Measures Association should be complimented for their frankness and alertness in bringing this matter to the attention of all weights and measures officials.

VEHICLE-TANK CODE

A weights and measures official recommended that table 2, page 101, be amended to provide a greater tolerance on "special" tests for drafts of less than 100 gallons. It was the contention of this official that the error in a vehicle-tank meter as disclosed by a so-called "split-compartment test" (a "special" test) is, quantitatively, unaffected by the magnitude of the test draft, and that the table of tolerances should recognize this fact. During the open meeting the official pointed out that this was no longer an issue in his program because of the recent acquisition of additional testing equipment. The Committee, nonetheless, retains this item on its agenda for further study.

LIQUEFIED PETROLEUM GAS LIQUID-MEASURING DEVICE CODE

In cooperation with this Committee, the National Bureau of Standards has completed a study of certain problems involved in deliveries of LP Gas to the consumer. During the study more than 200 special tests were made on an experimental LP Gas test facility in the period from May to November 1957. This study was directed toward the solution to the problem of transferring liquid from a supply truck to a consumer's tank without the use of a pressure-equalizing line.

The test facility consisted of two 250-gallon tanks and one 100-gallon tank, all mounted on platforms, and other equipment such as a liquid meter with a vapor release mechanism, explosionproof electric motors and pumps, and all necessary piping, accessories, and connections so that liquid could be drawn from any one of the three tanks and delivered by any one of several methods to either of the other two tanks. The two 250-gallon tanks had both top-fill (vapor-space) and bottom-fill connections. The 100-gallon tank had a multi-valve with a bottom-fill tube. The tanks were also equipped with pressure-equalizing, meter vent, and pump by-pass line connections; volume, maximum fill, and pressure gages; relief valves; and thermometers for both liquid and vapor temperatures.

Basically, the tests could be classified under the following four methods of delivery: (1) bottom-fill, (2) top-fill (vapor-space), (3) bottom-fill through ejector, (4) bottom-fill through Y connection. The ejector is a commercial device, sometimes referred to as injector, eductor, and exhaustor. The Y is a conventional Y pipe fitting. One outlet from the Y is connected to the bottom-fill fitting on the receiving tank and the other outlet is connected to the pressure-equalizing line fitting. In each of these methods, a series of tests was run dupli-

cating as nearly as feasible the range of conditions that might be encountered in the field—conditions such as extremes of temperature and pressure, various diameters and lengths of delivery hose, different pumping speeds, piping restrictions, and pressure differential between the delivery and receiving tanks. Many tests were run under what was designed to be normal field operating conditions. Others would properly be classified as being under laboratory conditions.

The main problem appeared to evolve from the effects of high temperatures and pressures in either or both the receiving and supply tanks. During the tests, such effects were magnified by artificial means. The tanks were painted different colors (dull black and glossy white) so as to achieve maximum effect from the sun's rays and to establish different temperatures and pressures between the receiving tank and supply tank (a common field condition). During certain tests a tank was heated with steam or cooled with dry ice in order to create an even greater effect. Thus, many tests were conducted under extreme conditions, some with starting temperatures above 100° F. and with pressures over 200 p. s. i. g. Tests were run with the receiving tank and supply tank having a pressure differential as great as 75 p. s. i. g.

Other means by which test conditions varied were through the use of two different makes and types of pumps. One was rated at 40 gallons per minute; the other at 60 gallons per minute. A manual by-pass valve was used to control the rate of flow of the liquid. Several combinations of delivery hose were used, these ranging from $\frac{5}{8}$ inch to 1 inch in inside diameter and from 20 feet to 105 feet in length.

The following will summarize the conclusions of the four methods of delivery as determined by the results of the tests conducted by the National Bureau of Standards.

(1) **BOTTOM-FILL.**—Receiving tanks can be successfully filled by this method under certain conditions. So long as the atmospheric temperature remains below a certain point, the pressure build-up is not sufficiently great as to prevent filling a tank to 85 percent of its capacity (85 percent of capacity was suggested as the maximum safe fill point). During the experimental testing it was found that the critical atmospheric temperature was about 65° F. That is, with the temperature at or below 65°, a tank could be filled to 85 percent capacity without excessive pressure build-up. The higher the temperature rose above 65°, the greater was the pressure build-up and the percent of fill was correspondingly less.

It is concluded that LP Gas tanks can be bottom-filled without pressure-equalizing lines and with entire satisfaction in many instances. In the more northerly States a vast majority of the deliveries throughout the year could be satisfactorily made by this method. Conversely, in the warmer climates, and especially during the summer months, this method probably seldom could be used.

(2) **TOP-FILL (VAPOR-SPACE).**—If a delivery truck is equipped with a reasonably good pumping system, deliveries of LP Gas to tanks fitted with proper top-fill connections can be successfully made under practically all conditions that are likely to occur in normal commercial distribution. Thus, no problem exists when the receiving tanks are equipped with properly designed top-fill connections and the distributor uses delivery equipment that is reasonably efficient and in normally good condition.

(3) **EJECTOR (BOTTOM-FILL).**—Several different sizes of ejectors were tested. The device performed according to the manufacturer's claims. The ejector was effective when used within its designed and recommended range and when of the proper size, capacity, and the like, so as to be compatible with the system in which it was used.

(4) **Y CONNECTION (BOTTOM-FILL).**—This method resulted in improved conditions over the straight bottom-fill method, but was noticeably less efficient than the ejector method.

The Committee feels that, once all receiving tanks are equipped with proper top-fill connections and dispensing vehicle tanks have reasonably good pumping equipment, there will be no need for special devices or attachments.

The Committee realizes that there are many thousands of LP Gas tanks in domestic use that are not equipped for top or vapor-space filling, and also that very few, if any, dealers are equipped for the ejector or even the Y method of filling. It is acknowledged, therefore, that considerable time will elapse before 100 percent of the commercial deliveries will be made without the use of pressure-equalizing lines.

According to the information available to the Committee, only a few States are equipped presently to test LP Gas fluid meters. A few additional jurisdictions are in the process of obtaining provers. LP Gas provers are expensive and it will be at least a year or two before an appreciable number of jurisdictions are adequately equipped in this field. These circumstances add weight to the Committee's opinion that the LP Gas Code should remain in its present form and without amendment for at least another year, and it is so recommended.

In order that the conversion to delivery without pressure-equalizing lines may be achieved with minimum inconvenience and expense to industry and consumers, it is recommended that all affected persons who have not already done so give immediate consideration to the early adoption of purchase specifications requiring top-fill (vapor-space) connections on all new tanks being purchased. It is further recommended that the LP Gas industry give careful study to possible practical plans for converting bottom-fill tanks presently in use to top or vapor-space filling.

The Committee is advised that in May of this year the Board of Directors of the Liquefied Petroleum Gas Association voted to approve the following recommendation of its Technical and Standards Committee:

In retail deliveries where the method of measurement and sales is through liquid meter into the consumer's tank, it is recommended that the filling connections over the straight bottom-fill method, but was noticeably less efficient than of the container.

By this action the Liquefied Petroleum Gas Association has earned the commendation of its customers and of weights and measures officials. The Committee is hopeful that by such action all affected persons who have not already done so will give their immediate consideration to the early adoption of purchase specifications requiring top-fill connections on all new tanks being purchased.

Since tests have shown that it is practical in many instances to make bottom-fill deliveries of LP Gas at temperatures below 65°, and since many deliveries are made at these lower temperatures, it is recommended that pressure-equalizing lines be not used on any delivery unless it is deemed by the operator to be essential to practical and efficient operation. It is the opinion of the Committee that, if industry will follow these recommendations, satisfactory progress can be made toward the ultimate goal of making all commercial deliveries of LP Gas without any probability of diverting a portion of the customer's product to the supplier's tank and in a manner that should be entirely practical and economical from the standpoint of both the consumer and the dealer.

In conclusion, the Committee reiterates its recommendation that no changes be made at this time in the Code for Liquefied Petroleum Gas Liquid-Measuring Devices.

MR. PAUL TUCKER: As Chairman of the Liquefied Petroleum Gas Association, Technical and Standards Committee, it is with regret that we in the Liquefied Petroleum Gas Association feel it necessary to make this statement with regard to the S and T Committee report as it pertains to Liquefied Petroleum Gas. Although our cursory review of this portion of the amended final report relating to the LP Gas industry shows no immediate cause for disagreement, we wish the Conference or Committee records to clearly show that the LP Gas industry did not have adequate time to study and review in written form the filling test conclusions as submitted in the final report of the S and T Committee.

However, at this same time we do wish to point out that the tests run by the Bureau were excellent. They were quite complete, well designed, and most capably conducted. A committee of the industry visited the test site and discussed the test setup and procedures. During the same summer, our industry conducted similar tests. Though the results have not been finally and completely summarized, it can be stated here that the conclusions are analogous.

LIQUID FERTILIZERS

The Committee has received from a meter manufacturer suggested language for a code for liquid-measuring devices in liquid-fertilizer service and expresses its gratitude for the forthright and helpful approach as demonstrated by the material submitted and the interest shown. Requirements for devices for the measurement of liquid fertilizers will be considered by the Committee during the ensuing year.

MR. TUCKER: I should like to offer the assistance of the Agricultural Ammonia Institute, whose members are concerned with the direct application of anhydrous ammonia as well as aqueous ammonia. I am sure the National Plant Food Institute would also be very much interested in cooperating with and assisting in any review, test, or method of establishing such procedures for the measurement of liquid fertilizer.

(The report of the Committee on Specifications and Tolerances was adopted by the Conference.)

THE TASK AHEAD

By HON. B. J. BUTLER, *Commissioner, Department of Agriculture,
State of Kentucky*

I am deeply honored to have been asked to appear on your program and to bring you a brief message on this most important subject of honest weights and measures.

I am certain that all you who work in this field are aware of the great service you render to all our people. It is often my feeling that too many of our citizens beyond your profession do not really know of this watchdog service which you continually provide them.

Before progressing further, I believe it proper to quote you some three verses of scripture which certainly point out the very basis and objectives of your work (new version text).

Proverbs 11: 1 A false balance is an abomination to the Lord, but a just weight is his delight.

Proverbs 20: 23 Diverse weights are an abomination to the Lord, and false scales are not good.

Deuteronomy 25: 13-16 You shall not have in your bag two kinds of weights, a large and a small. You shall not have in your house two kinds of measures, a large and a small. A full and just weight you shall have, a full and just measure you shall have; that your days may be prolonged in the land which the Lord your God gives you. For all who do such things, all who act dishonestly, are an abomination to the Lord your God.

And so you see you are supported not only by the laws of your States, but also by the "Good Book." I am certain that each of you has a pet client or two you would like to quote these to!

I think it is well that we should reflect briefly on the accomplishments of workers in weights and measures. Here I must refer to my State of Kentucky to point out what has been done there by George Johnson and his able staff in our Division of Weights and Measures. They are a relatively new facet of our State Government, but, through their untiring efforts during the past decade, I feel certain that we have moved to a position of respect in this field.

In the checking of scales we now have a pattern and system established that gives our entire area good coverage. Yet we are ever alert and occasionally find a set we have missed. Such a case occurred last summer in a grain elevator. We received a complaint from a farmer about the weights at this particular storage facility. The following day our large scale unit moved in and tested those scales. To our great concern these were found to be short weighing almost 1,000 pounds per truckload of grain. The company promptly made some adjustments with the farmers and we immediately got a complete listing of all grain storage facilities from the State ASC Office. To our relief this was the only one of these establishments we were missing in our checking procedure, but it was a critical oversight. This elevator was in an out-of-the-way place, some ten miles from town and on a back country road. This, I think, emphasizes the importance of constant vigil in our endeavors.

In addition to these large scales just mentioned, we also have many more of them in stockyards and coal companies. Last year we had about a 14 percent condemnation on them as compared to a 60 percent condemnation some ten years ago. In our small scale checking we find a higher percentage condemned—4 percent last year as compared to 9 percent ten years ago. This shows quite clearly the progress made, yet also reminds us there is much more to do.

I might point out in connection with the small scales that some two years ago one of our workers confiscated a rather interesting small dial scale. A man running a huckster wagon was seen weighing potatoes to an unsuspecting customer. Our man stopped upon noting the terrible appearance of the scale. The indicator was made from a piece of tin can and was soldered crudely to the mechanism that activated it. The original face or dial had been destroyed or worn out through wear and had been replaced with one crudely made from the cardboard from a tablet back. The markings were not even numbered to indicate the pounds.

The customer purchased two pounds of potatoes. When placed on our test scales, they weighed one pound, to which the ever alert salesman promptly remarked, "You know, each one of those marks on there must be one-half of a pound. I thought all the time they were one pound."

Needless to say these scales were collected on the spot and are now held in our Department as a museum piece.

Our people have also been extremely alert and aggressive in checking for strict compliance in the field of packaged commodities. When this work was begun, there was about a 28 percent condemnation. The percentage last year was 14 percent from a sampling of over 300,000 packages.

In the past two years we concentrated our efforts at various times on feeds, seeds, and fertilizers. Here, again, there were many problems uncovered as well as created; but we rode out the storm, and I believe our feed, seed, and fertilizer manufacturers operating in Kentucky now look with pride on their compliance and achievement.

Sometimes we become complacent in our routines and need a slight jolt to wake us up. This happened to some of these people. Here may I emphasize that not all the weight discrepancies are against the consumer. We found one fertilizer company bagging 94 pounds of fertilizer in 80 pound bags—a sure way to lose money fast.

In another instance we found considerable feed in short weight at the point of manufacture. The man who ran this mill was a personal friend of mine and so I was called into the act. I went to his mill, where he proceeded to give me the facts of life about shrinkage in feeds and the waste of taxpayers' money. I am certain this group has never heard of these things!

During our conversation a customer came up and ordered a half ton of dairy feed. We had all this feed condemned and the miller wanted to go on and sell the man ten bags of the off-weight material. This we refused and suggested that he empty some of it into the hopper and rebag it. Reluctantly he had this done, and the ten bags were rolled to the platform for loading on the farmer's truck. There our men converged with their test scales. Three bags of the ten were in proper weight and one was seven pounds short, with an average shortage of over three pounds per bag! Needless to say that gentleman pays more attention to his bagging equipment now than in the past and his attitude toward the Department is very much improved. He was not dishonest—he just thought he was right and did not want to be told he was wrong.

In Kentucky we also have made great strides in our meter testing, both large and small, and I believe our coverage is quite thorough. Recently we got into LP Gas checking. We found about 36 percent of those containers off weight. Let me hasten to say that some were overweight; in fact, about one-third of those out of weight were in this group. Let me here emphasize that your work is just as important in protecting the legitimate merchant as it is the consumer.

The LP Gas dealers, upon finding the results of our tests, immediately went to work to get their people in compliance. Their attitude has been wholesome; like any other group, they desire to enjoy a good reputation in their business.

I am certain that most of the States here represented can look with equal pride on their individual accomplishments. But what of the task ahead? Anyone can look back on what has been done, but it takes courage, vision, thought, and initiative to look ahead. Have we not now arrived at a point in this work where we need more standardization and co-ordination among the States? Do we not now need

to take a more careful look at our individual efforts and dig a bit deeper in some areas? This I would project as your challenge.

I am aware to some degree of the courage it requires to do your jobs in weights and measures properly. And I would remind your superiors of their tremendous responsibilities in supporting you and standing behind you. This might well be the determining factor between a strong or a weak program within a State.

I am not unmindful of the clever way in which you men can detect this. Let us go back to a tobacco warehouse case some two seasons ago. There our men uncovered some extensive short weights one Saturday. That evening Director Johnson called me and asked that I go to that area on Sunday with him. I turned down his invitation on the basis that I had two speeches to deliver Monday and had not as much as outlined either. About an hour later one of the men called from the area in question and insisted that I should come down the next morning. Fortunately, I decided to go.

The seriousness of this situation became apparent when I was told on Sunday morning by our men that the man in charge of the warehouse was one of my friends. I could now see why they had called me. Then came their appropriate question, "How far do we pursue this case?" And quickly my answer, "To the bar of justice with every bit of evidence you can scrape up." I could see the expressions of relief replace those of anxiety. I spent a good many hours on that case personally, but it was a good investment. Everyone now knew that temptations and pressures were not guiding the destiny of our sworn duty.

It was a famous man of Kentucky birth who pointed the way here when he said, "Let us have faith that right makes might, and in that faith let us dare to do our duty as we understand it." It was that same Abe Lincoln, who, when reminded about the political expediency of doing a thing a certain way, replied, "I desire to conduct the affairs of this office so that at the end of my time, when I come to lay down the reigns of my authority, if I have but one friend left, that friend shall be deep down inside me."

The conduct of your division's activities and the personal conduct of its employees will determine in large measure the prestige you enjoy, the operating funds you will receive, and ultimately the amount you are able to accomplish.

Yours is a most important task—do it with courage and uniformity, treating all alike under similar circumstances. And I would challenge you as an organization to move vigorously toward uniformity of standards without delay and without fear.

We need, in many cases, new laws, new regulations, and new standards. This I know is true in Kentucky. During our recent session of the Legislature, we made an effort to put through some four bills of vital importance to our weights and measures work. Two of them passed, one of which was vetoed. But this does not discourage us—we will be back next time prepared to do battle in better form.

The words of the old Scotch ballad express our attitude here:

I'm wounded, Sir Andrew Barton said,
I'm hurt but I am not slain,
I'll lay me down and bleed awhile,
And then I'll fight again!

In developing new laws and regulations, continuous emphasis should be placed on making them as compatible with other States as possible. Unless we do this we cause confusion and open the door to criticism and bargaining levers among the various trades. On this point I am glad to say that Kentucky is in the process of adopting the entire Handbook 44 codes of the National Conference. This should be accomplished in the very near future.

We should not pass this juncture without making mention of the long sought hundredweight for grain. It seems to me that everyone but a limited few favor this change. What then holds us back? Are the vocal minority of more importance than the placid majority? Too many of our laws and regulations get on this basis, I fear.

Earlier I mentioned the necessity of digging deeper into your activities. You have now fairly well eliminated most of the bad scales—now what about the man behind the scales? There may be a few of these that need adjusting or eliminating—at least from the weighing business! That was our problem in our warehouse case—the scales were fine but the weighman was out of adjustment!

To correct this will require different and well planned techniques, constant vigil, and a tenacious pursuit of the problem. You will be trying to detect a very few amongst a multitude and to do this without offending the just.

I am reminded here of the story of our two Kentuckians who were in the coal business. One of these men got religion and eternally insisted that his partner do the same. Finally he ventured forth with this statement, "Bill, I'd join the church, but who would weigh the coal then?"

I am told of another case where a young man worked some five years at a coal yard before he found out 1,600 pounds was not a ton!

Your work, I think, will always offer a challenge. One hundred years ago there were only some 200 different food articles offered for sale in this country. Today there are more than 32,000—practically all of which are subject to weights and measures laws. An ever increasing number of these also fall into the prepackage class which takes your job beyond the mere checking of scales.

There is one thing that your work should always offer and that is variety. I am certain those of you who pursue it vigorously will find few, if any, dull moments. This is good for it keeps monotony at a safe distance and makes for work that one can enjoy doing. Sometimes we allow ourselves to be caught in a rut alongside a paved highway merely because we do not take the initiative to improve our position.

Here I recall the story of the factory worker who opened his lunch pail and dejectedly complained, "Cheese sandwiches, cheese sandwiches, always cheese sandwiches!" To which one of his fellow workers offered him some advice, "Why don't you have your wife fix you something different?" To which our complainer replied, "Wife? Who has a wife? I fix these myself."

Again let me tell you that I am honored to have been asked to appear before this important and distinguished group. I trust that I have said at least some little thing that will help you in your daily living and in carrying out your vital assignments. The task ahead offers many challenges. I am sure you will meet them with courage and that you will conquer them with distinction.

MANAGEMENT AND THE CONTROL OF WEIGHTS ON PREPACKAGED PRODUCTS

By J. A. WARREN, *Technical Advisor, Packaging Division, American Management Association, New York, New York*

The more competitive a market becomes, the greater is the need for more competent and skilled management of companies competing in that market. In this era of mounting costs and the struggle to maintain profit margins, many companies have found that the answer lies in better operational efficiency rather than in price increases. As a result, every avenue of cost reduction must be vigorously investigated. Producers of packaged products are scrutinizing the costs of filling. Laws compel them to meet the weight legend inscribed on their package and overfills result in an economic loss that can run into large sums. The control of fill is a dendritic problem. It encompasses every segment of packaging—management, material, machinery, manpower, and movement.

To be effective any program of fill control must have a management policy that sets standards in terms that everyone can understand. Management must provide the means to carry out the standards. Management must take the necessary precautions to determine to what extent the standards are being met. When standards are not met, management must initiate the steps to diagnose and locate the trouble, and, finally, when the difficulty has been pin-pointed, to take the proper and preventative action. Let us transpose these academic phrases into practical application.

Before attempting to spell out a standard, management should ascertain what law or series of laws regulate the fill of their package, how the law is interpreted by enforcement agencies, and what regulation pertains to their products:

Food, Drug, and Cosmetic Law, Deceptive or Slack Fill Law, Alcohol Tax Unit Regulations, the weights and measures laws of the States where their products are sold, and Department of Agriculture Regulations.

The fulcrum of the standard is the prescribed weight legend of the package. The problem now for management is to set a standard of control, with no compromise. Variables of product, container, equipment, and personnel must be determined by process capability studies and allowances for these variables calculated in the standard. What are the variables that must be considered?

The product: Is it free flowing? Is its density uniform—does the density vary from batch to batch? Is the density affected by moisture or deaeration in handling? What are its flow characteristics? Size and shape of the product. Condition of storage. Do temperature conditions affect the product? What is specific gravity? Does the product bridge?

Many of the problems in powder or granular filling operations are due to the lack of understanding of the flow of solids, particularly the flow of solids through bins, hoppers, feeders, and spouts. Any arching, hanging up, or sticking of materials may disrupt the operations of an automatic system. An excellent report on the development of a quantitative method of design is, Bulletin No. 64 of The Utah Engineering Station, by Andrew W. Jenike, University of Utah, Salt Lake City, Utah. The brochure covers, typical obstructions to flow pressure, flow factors, formulas of flow, model bins or hoppers, instability of doming, the influence of the slope angle of the walls for

friction between materials and wall, influence of pressure normal to the dome, funnel and mass flow, instability of funneling, and cleavage through materials and along hopper walls.

The location of bins or hoppers in relation to the filling machines is important to control head pressure flow characteristics of the product. Mr. Jenike's treatise gives many useful hints to prevent bridging in hoppers, how to determine the angle of repose of material, pressure breakers, formulas of flow, the influence of vertical walls of a hopper, causes of compacting pressure, changes on the surface of particles caused by the escape of entrapped air or moisture content and bin design.

The combination of bin or hopper design and characteristics of the product have an important influence in setting a standard of weight control. They point up the need of skilled engineering and layout planning.

Filling equipment: Powder and granular filling presents a greater problem than liquid. Before control specifications for fill weight can be set up, the filler must be evaluated under actual conditions at varying speeds. The best control of fill economy is obtained when you have the correct proportions between speed and overflow. In other words, the relationship between speed of the equipment and the amount of overflow or underfill is the determining factor in economic operations.

Powder or granular filling can be affected by: (1) Stop and go operations which cause the product to compact, (2) control of vibration in handling product, (3) adjustments of the filler, (4) uncertainty in cut-off-product in suspension, (5) head pressure—variations in the amount of product in the hopper, (6) changes in the flow characteristics of the product—bridging, (7) size and shape of product, (8) conditions of storage—flour, (9) maintenance of equipment, (10) frequent adjustments, (11) compacting of product—cake mixes for example, change in pressure will affect the degree of compacting, changing flow pattern and density and causing package fill variations. Shredded coconut and noodles will interlace and flow only with the greatest difficulty, (12) variable speeds, (13) spillage, (14) packing room humidity, (15) sanitation—daily cleaning, (16) uniformity of pockets in filler—it is important to demonstrate that the fill within any one filler pocket is the same as it is among all pockets. This is important that random samples may be taken from the filler as a whole without regard to the individual pockets, which simplifies the procedure of determining the pattern of the filler.

Variation in weight does not stop when the package is sealed. Storage conditions may affect weights.

The problems in liquid fill include: (1) Specific gravity of product, (2) temperature—you must have consistent temperature at the point at which the product is put into containers, (3) hopper level—head or pressure variations may seriously affect the amount of liquid in vent tubes—proper liquid level control, (4) speed—variation in speed results in change of filling time—allows more entrapment of air, (5) aeration—leaky pumps and lines following deaeration equipment will undo work of deaeration. Product as it reaches the filler may have more air in it whipped in by the pump than when it entered deaerator. Product allowed to stand say 15 minutes in a holding tank will result in a heavier fill than one that has been run direct through the

line without any standing time because the standing time has allowed entrapped air to gradually escape, (6) transfer of containers—spillage—nonuniform fill and excessive clean up, (7) sanitation, (8) frequent stopping and starting.

Items that will affect measurement accuracy include materials, variations in capacity of containers as in the case of glass or cans where these are measuring elements, variations in the weights of cartons in gross weighing, and the differing skills of people, and the competency of supervisors. A process capability study including these factors should enable management to set a standard that is technically practical, economically reasonable, and in keeping with good manufacturing practices.

Management's next responsibility is to provide means to carry out the standards. Most managers recognize they have a problem of variation and they need a modern method of statistical quality control. S. Q. C. has been proven in fill control programs. You have had some excellent presentations on its use during these meetings. Quality thinking and directions must start at the top to do the most good. In filling line operations, S. Q. C. must concern itself with the control of weights or fills on a day-to-day basis. Any attempt to imply that the responsibility for quality control on a day-to-day basis rests elsewhere than in the packaging lines will prove abortive. There must be the authority of seeing that proper adjustments to machines are made so that the targets of fill are met.

The control of fill in the past 10 years has been facilitated by the introduction of semi-automatic and automatic checkweighers. Checkweighing may be classified into 5 types: (1) spot-checkweighing with control based on operators judgment, (2) spot-checkweight with statistical control, (3) automatic 100 percent checkweighing with control based on an operator's monitoring the reject gates, (4) automatic 100 percent checkweighing with automatic statistical control, and (5) automatic 100 percent checkweighing with automatic filler adjustments.

Spot-checkweighing can provide only a gross control, since there is no systematic way of differentiating between pure change variations and shifts in the distribution resulting from assignable causes. The success of this system depends upon the operator's experience with the particular line and perhaps a well-developed intuition. The manual spot-check system may be adequate if: (1) the standard deviation of the line is small in comparison with acceptable tolerances, (2) the pattern of variation is statistically relatively stable, and (3) the cost of the product is low in comparison to labor costs.

A manually operated spot-check system can be made more effective at little or no increase in operating costs by incorporating statistical control, rather than depending on operator judgment, providing a systematic, scientific procedure for detecting weight variations due to assignable causes. A statistical weight control system can be effective, provided the pattern of weight variation and the operating speed of the line are compatible with this type of control. A manually operated spot-checkweighing system with statistical control can be effective if the pattern of weight variability due to assignable causes is fairly stable, i. e., if shifts in the distribution average occur gradually and never experience sudden jumps of any magnitude. It should

always be recognized that a spot-check system can never assure that *all* packages will be within selected tolerances.

The automatic checkweigher weighs 100 percent of the packages and sorts out those that do not fall within selected tolerances. It assures that all outgoing packages are within the selected tolerances, regardless of the weight variability pattern of the filling line.

The automatic checkweigher can be used to detect shifts in the average and standard deviation of the weight distribution of the packaging line by properly setting and monitoring the reject limits. The checkweigher normally should be set so as to reject packages that fall in the tails of the frequency distribution (approximately at plus and/or minus 3 standard deviations). Under stable operations, the machine will reject a small percentage of packages at both the over and under reject gates. An increase in the percentage of rejects at one gate indicates a shift in the process average toward the limit. An increase at both gates indicates an increase in the standard deviation of the distribution. Since 100 percent of the packages are being inspected, a change in the percentage of packages rejected can be detected quite easily and many times the operator can effect filling machine control. Operators must be trained to conscientiously monitor the reject gates for the purpose of controlling the machine. Some people do not use the upper reject limit for they attempt only to protect against underweight packages. Even though packages rejected in the upper limits are not trimmed but put back on the line, information made available by the packages rejected at the upper limit is essential for the most effective filling control.

The automatic checkweigher with automatic statistical control employs a combination of both of the basic approaches to weight control mentioned earlier. This equipment supplies quickly and easily complete statistical records of the filling line performance. This feature is useful in analyzing the weight control performance of a new line. There is a further adaptation of the latter unit: adding automatic mechanical equipment to automatically adjust the filler when it goes out of prescribed pattern.

Management should provide the best type of filling equipment available. In powder or granular filling, machines will operate from 10 per minute up to 400 per minute and in liquid or viscous filling, up to 1,000 per minute on can lines and 700 per minute on glass. The faster the speed, the greater is the accountability for control, losses due to overfill will be more accumulative, and the hazards of underfill greater.

Other filling speeds are: net weights—speeds limited to 15 packages for head, but may be multi-head, are used for costlier products and for control of product in suspension; gross weighers—nonfree and free flowing products with speeds on line up to 120 per minute with product in suspension; volume weighers—less expensive product with speeds up to 400 per minute wherein density of product and head pressure are important factors, found in units using containers as measuring up with special consideration for variation in container volume and including anger-type fillers; vacuum weighers—speeds from 30 to 300 per minute with free flowing product, vacuum controlled; stream flowing—free flowing grainy or granular products with speeds up to 600 per minute, normally used with inexpensive product, offers high speeds; rotary and straight line piston liquid and

viscous fillers—speeds up to 1,000 per minute for baby food and motor oil lines, offering viscous density control, specific gravity control, vacuum fillers, and nonfoamy liquid fillers with speed up to 425 per minute; gravity fillers—speeds up to 90 per minute, but not as accurate in fill measure as vacuum fillers; premeasure filler—for ethical drugs and expensive products with speeds to 300 per minute.

Competent management will want to know how their operation is performing at all times. A series of reporting graphs detailing adherence to budget records for a prescribed period compared with a control period, monthly or weekly. Sequential comparisons give management a quick method of evaluation and noticing trends. Frequently the careless operations of other departments that may cause the fill control program to roam can be detected. Short reports highlighting day-to-day performance pinpoints areas of responsibility not performing to standards. Quality control and unscheduled checking of production filling operation keeps the filling operation supervisors on their toes. Spot-checking of warehouse and samples returned from the field assist in rechecking production data. Strict adherences to the program must emanate from the topside if it is to permeate the whole organization.

Honest value to its customers in meeting prescribed weight legends and honest returns to the company in controlling excessive overfills must be a management responsibility.

DISCUSSION OF FOREGOING PAPER

MR. MADDEN: I have found empty cartons in a store that were supposed to contain 12 ounces of cereals. What would be the cause of such an error?

MR. WARREN: There could be a number of factors—bridging within the hoppers, the trip mechanism of the container in the operation, for example. However, this is a very simple thing to control. One of the methods that I myself have used to control that type of error in lightweight packages is to play a jet of controlled air on the filled packages with a computed force; the air will not tip over a calculated weight, but it will tip over any lighter weight.

However, cereals are not packaged very fast, because most cereals are packaged on net weight scales. I would say the difficulties you are talking about, Mr. Madden, probably are caused by careless operators on the line.

MR. WRENN: I notice some of the packages you mentioned in your talk are larger than necessary to contain the commodity. When filling by these automatic means, is it necessary that a container be larger?

MR. WARREN: May I ask you: What product are you talking about?

MR. WRENN: Detergents generally.

MR. WARREN: I think yes, very definitely, because at the fill operation on detergent packaging today, which packages are filled on never-stop machines, there is an aeration problem—air within the product itself. These packages are filled at a rate of between 300 and 400 packages per minute. About one of every four packages is weighed automatically on this equipment. As the packages come off the end of the line and before they go into the checkweighing unit, they are vibrated. If, after vibration, the fill height is below a set standard, the package will be ejected by the machine. However, con-

tinuing settling of product occurs after the package gets out into the field. A great deal of research is being given to improvement of this. I think the improvement has to come within the detergent itself.

MR. BAERWOLF: In your liquid fill you mentioned that you have a problem of aeration of the product. Do these fillers have mechanical air elimination?

MR. WARREN: Depending on the product, many of them do, particularly in the food industry.

SHRINKAGE LOSSES IN FOOD PRODUCTS

By A. C. O'MEARA, *Assistant General Counsel, Swift and Company, Chicago, Illinois*

For the purpose of considering the problem I have chosen as my subject for today, contrast, if you will, the retail food store of fifty years ago and the modern supermarket as we know it today. The average retail store of fifty years ago had no more than a few hundred items for sale. Most of these items were shipped to the retail market in bulk and many of them were available only in season. Items were purchased by the housewife at the store under conditions where the grocer would take from the bulk product a quantity designated by the consumer, at which time it would be weighed and sold. In 1910 if you were to buy butter, lard, or shortening, it would be ladled from a tub. Crackers came in bulk in a barrel. Pickles, flour, sugar, potatoes, onions, and meat—in fact, practically all foods except a few canned items—were sold by the manufacturer to the retailer in bulk, after which the retailer would break them down into the amounts the customer wanted at the time of the purchase. In 1910 products were available only at certain times of the year. Fried chicken was normally served in the spring. Fresh fruits and vegetables were available only in season. In the winter months it was impossible to buy bananas or oranges or other citrus fruits.

What do we have in 1958? The modern supermarket carries approximately 5,500 individual items for sale to the consumer. Not all of these are food items. There is a constantly increasing number of items added by the retailer, including various types of hardware and other products which compete for the customer's attention. In the self-service supermarket of 1958, the sale of products which have not been prepackaged by the manufacturer or the retailer is increasingly rare. The housewife no longer relies on the judgment and advice of the owner of a grocery store or his clerks, but selects the products herself. In turn, the modern supermarket has far fewer personnel, and products in packages must sell themselves. Refrigeration, improvements in packaging material, radical advancement in transportation, and distribution facilities make available to today's housewife an infinite variety of products at all times of the year. This would have seemed like a dream to the housewife of 1908 and 1928.

The most revolutionary changes in the processing, packaging, and distribution of foodstuffs have occurred in the decade following the end of World War II. Consider, if you will, that since 1948, when refrigerated display cases began to become common in supermarkets, over 40 percent of the total fresh meat purchased by consumers has been purchased in self-service meat counters where the housewife can pick up the package, look at it, feel it, squeeze it, and determine

whether or not she wants to buy it. Does it cost more? Yes it does, but that is the way she wants to buy it.

This revolution in the processing and distribution of food has created a multitude of problems, not only for the manufacturer who distributes his product on a national basis, but also for the weights and measures officials of the various Federal, State, and local jurisdictions. Packaging and distribution methods are new, but by and large the net weight laws of the various governmental jurisdictions remain substantially the same as they have been for many years. This raises the question as to whether those laws are adequate for the protection of the consumer in the year 1958.

By and large, weight laws are the same, or substantially similar, in content in the various jurisdictions. However, in my experience, there has been a lack of uniformity in the interpretation and enforcement of these laws. Therefore, let us consider the question of what the weights and measures problems are which arise in connection with prepackaged foods prepared at the manufacturing or retail level. It is a well-known fact that all foods contain moisture, and most foods contain moisture to a very substantial degree. Further, it is a well known law of physics that, at any time when there is less than 100 percent humidity in the atmosphere, evaporation of some moisture in a food will inevitably occur unless the food is one which is hermetically sealed in a moistureproof container, or one which is described as hygroscopic and which will absorb moisture under those conditions. The rate and amount of evaporation of moisture in foods will vary substantially, depending upon the relative humidity of the air, the temperature at which the product is held, the length of time the product is held, the nature of the packaging material in which the product is placed, and the amount of moisture naturally found in the product itself.

Consequently, if you will think of time in a relative sense as a dot moving along a horizontal line toward infinity, and think of the weight of a product as a dot moving along a descending line of decreasing weight as evaporation of moisture occurs, it is an inescapable fact that at only one given instant of time will the marked weight on a package be equal to the actual weight of the product inside the package. Therefore, as we approach the problem of weights and measures and the enforcement of the weights and measures laws as it applies to prepackaged foods, we may ask the following question: At what point of time must the weight of the actual product equal the weight marked on the product?

The weights and measures statutes and regulations issued in pursuance thereof are primarily police power statutes and regulations. That is to say, they have been enacted primarily to protect the interest and welfare of the consuming public, and this is properly so. The question might well be asked, however, "Are the present laws suited to give that protection?" For an answer to this, let us take a brief look at the laws which are representative of the various jurisdictions.

Section 403 (e) of the Federal Food, Drug, and Cosmetic Act provides that a food shall be deemed to be misbranded if in package form unless it bears a label containing an accurate statement of the quantity of contents in terms of weight, measure, or numerical count. The statute then provides that reasonable variations in weight shall

be permitted by regulations promulgated by the Secretary. Pursuant to the authority contained in the Act, the Food and Drug Administration has issued regulation Section 1.8 (j) which provides that no variations below the stated weight shall be permitted unless caused by ordinary and customary exposure, after the food is introduced into interstate commerce, to conditions which normally occur in good distribution practice and which unavoidably result in a decreased weight or measure.

A typical State law requires the net quantity of the contents to be conspicuously marked on the outside of the package in terms of weight, measure, or numerical count, but goes on to provide that reasonable variations and tolerances shall be permitted and requires the State Superintendent to fix such tolerances.

Although there was a substantial number of years separating the enactment of the two above-quoted laws, you will note their similarity. Further, this State statute is fairly representative of the statutes of the several States. These laws, by all means, should be administered in a manner which lends itself to the most efficient methods of enforcement by public officials for the maximum protection of the ultimate consumer, but, at the same time, in a way which is fair to the various members of the chain of distribution, including the manufacturers, the distributors, and the retailers.

From my experience as an attorney, I believe the methods of enforcement of the laws may be broken down into three broad categories:

1. Those jurisdictions which follow the rules set forth in the Federal Food, Drug, and Cosmetic Act and the regulations thereunder, providing for reasonable variations in weight.
2. Jurisdictions which recognize a tolerance expressed in a fixed percentage.
3. Jurisdictions which allow no tolerance and maintain that a product must equal 16 ounces to the pound at the time it is purchased by the consumer.

The jurisdictions which follow the principle of a fixed tolerance overlook three salient points: In any rule where a fixed tolerance is created, whether it be in weights and measures, minimum fat requirements for milk, or any other similar type of regulation, there is a tendency for the minimum requirement to be the target at which to shoot. Therefore, instead of representing a point below the target, which offers a cushion for margin of error, it automatically tends to become a maximum. Second, the moisture naturally found in different foods may vary from 8 percent to 80 percent. It is unrealistic to apply to all products a fixed percentage or allowance for variations in weight, for the reason that such variation percentage presupposes that all products are going to vary by the same percentage or degree. The variation which might be considered reasonable for a Virginia ham, which has a low moisture and high salt content, certainly would not be reasonable for fresh eviscerated chicken, which has a high moisture content. Third, the principle of allowing a fixed tolerance particularly discriminates against a manufacturer who distributes his product on a nationwide basis. For example, let us assume that a State recognizes the tolerance in weights at a fixed 11½ percent. Out-of-State manufacturers distributing products in that State through channels of interstate commerce would have to sufficiently pack their product in order to guarantee that the variations in

weight while in the channels of commerce would not exceed the allowable tolerance. On the other hand, a local manufacturer would be in a position to weigh, package, and deliver his product on the same day and, if he so desired, take advantage of the full tolerance without in any way violating the law.

In spite of these three shortcomings above outlined, it can be said that the fixed-tolerance rule is far more realistic than the no-tolerance rule because it does in part recognize the principle of evaporation of moisture.

There seems to be no logical argument to support the regulation which recognizes no variations in weight such as inevitably occur in good distribution practice. When a manufacturer packages product, he cannot know whether the consumer will buy the package from the retailer in three days, three weeks, or three months following the time it is weighed and packaged, yet he knows that, with each passing hour, there will be a slight variation in weight. For which particular day must a manufacturer be sure that the weight marked on the package will equal the weight of the product? The no-tolerance rule also fails to recognize the fact that you can take two identical products and place them in the hands of different retailers and the difference in handling the product will, at the end of the week, in all probability result in there being a substantial difference in the weight of the two products. Some of the exponents of the no-tolerance rule have indicated that the manufacturer should overpack his package and so guarantee that it will be full weight when it is purchased by the consumer. They do not tell you how much to overpack and for how long you must guard against the variations in weight. Such jurisdictions also ignore the fact, while the package may be overpacked, this practice represents an additional cost which will be reflected in the price the consumer has to pay. Lastly, they overlook the fact that any law which would require you to overpack is of questionable validity under the Fourteenth Amendment of the United States Constitution.

There have been a number of outstanding decisions dealing with this problem. As early as 1924, a very wise judge, sitting on the Supreme Court of one of our States, held that a statute defining as a misdemeanor any variation between the marked weight of the package and the weight of the product was unconstitutional where the statute did not provide for variations in weight and for tolerances. As a matter of interest, I would like to read to you a portion of that judge's decision:

There appear in this law no tolerances, no variations, no questions of knowledge, willfulness, intent to defraud, etc. It appears inevitable that the dealer in such articles would perforce have to weigh each package in his store every day and put thereon a new brand after each weighing, setting out the weight as of that day, according to whether the contents of such package had been increased or diminished in weight by the absorption or evaporation of moisture. It seems to us that we need carry the argument no further. The statement of facts carries with it its own irresistible conclusion against the soundness of this law. The condition referred to would be intolerable. The sale in this country of such stuffs in packages is imperative. The restrictions and conditions attempted to be imposed by this law are harsh and oppressive to such an extent as to render it practically incapable of enforcement and violative of the Fourteenth Amendment to the Federal Constitution and Section 13, Article 1 of our State Constitution.

Although the decision I have just quoted was rendered in 1924, I submit to you that the learned judge who wrote the opinion might well have written it in a case in 1958. In 1936 the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder were construed by a U. S. District Court. In this case, the court held that the Government must not only establish the tolerances, but then must carry the burden of showing that the weight deficiencies exceeded those tolerances rather than requiring the defendant to go forward with the mere showing by the Government of a discrepancy between the actual weight and the stated weight. In a recent decision construing a State law in 1955, the Supreme Court of one of our States had under consideration a statute in which the director of weights and measures had been instructed to promulgate reasonable variations and tolerances. However, the director at the time of the case had not promulgated any such regulations. The court held that the criminal conviction of the defendant could not stand because no consideration for variations in weights and measures had been given by the State weights and measures officials. The court construed the statute to require the director to prescribe such variations before the State statute could be enforced.

The well reasoned cases which have just been referred to illustrate the sound logic underlying the recognition of the facts of life concerning the loss of moisture in food products and the resultant variations in weight.

Perhaps at this time it would be well to state certain inescapable conclusions with reference to prepackaged foods. In the first place, they are here to stay. In the year 1958, Mrs. Housewife has come to expect to be able to buy foods packaged in the four corners of the earth and to be able to buy them on any day of the 365 days in the year. She may get lobster tails from South Africa. She may get frozen salmon packaged in Alaska. Many specialty items are processed and frozen in Europe and brought to the United States. Tea and coffee are not all packaged in the United States. There is an unlimited variety of food imported into this country annually. Furthermore, the heaviest concentration of population in the United States lives in about 20 percent of the geographical area, whereas 80 percent of the food is produced outside of that area. There is no State nor any city which can long sustain itself on food produced within its own borders. Consider, if you will, the ultimate results of the enforcement of laws which is so oppressive that it would drive a national distributor of food products out of one of these markets. Who would primarily suffer? For an example, let us consider any important fresh and perishable food that is considered a staple in the human diet. As stated before, the State's total production of the product is far below the actual consumption of its citizens. If national distributors are driven out of the market because of conditions which permit distribution of their products at a loss, the basic economic law of supply and demand comes into play. The only product available is that locally produced; being in short supply, the consumer price for it will rise sharply. After it reaches a certain point the national distributor may return to the market because the price will be sufficiently high to permit giving away product without suffering a loss, but his memory of past experience may deter his again becoming involved. In any event, the price will continue to be

higher. Who will pay the higher cost? Weights and measures laws are primarily designed to protect the consumer, but here they militate against him in a direct and painful manner.

Distribution of foods on a nationwide basis is not only desirable for the housewife from the standpoint of the interesting variety of meals she can cook, but they are absolutely essential to health, if not to life itself. We have long since passed the time when you could obtain certain foods only in season if they were produced in your area and when certain foods, because of the geographical distance away from their production, were not available at all. So, I say again, prepackaged foods are here to stay, and Mrs. Housewife of the United States will not let anyone take them away.

Prepackaged products are of high quality and ready for immediate cooking with little or no effort or time required in preparation. This saves Mrs. Housewife time. Balanced meals, including citrus fruits and other types of fresh vegetables which contribute to the health, are available on a year-around basis. Most important of all, these products have not been subjected to intermediate handling by an unknown number of persons, and thus we have eliminated to a substantial degree the possibility of contamination through additional handling and exposure.

What does the housewife buy? Does she buy merely a given amount of weight, or does she buy a given value of nutrition? Variations in weight caused by loss of moisture do not affect the nutritional value in food. The nutritional factor in food will remain practically constant regardless of the extent of the loss of moisture. For example, the definition of standards of identity for butter requires that butter contain 80 percent butter fat. This means that in 16 ounces of butter, there will be 12.8 ounces of butter fat. Now let us assume that, through mishandling or exposure, the butter which weighed 16 ounces at the time it was packaged and which contained 80 percent fat now weighs 15½ ounces. An analysis of that pound of butter will show that it now contains 82.58 percent butter fat, or 12.8 ounces of butter fat, which is precisely what the housewife is buying and all that she would have bought had she bought it at the time the pound weighed 16 ounces.

There may be some who are of the opinion that it is impossible to determine what constitutes a reasonable variation in moisture. However, if one takes a realistic approach to the facts, this problem disappears. Variations in weight in food products are self-limiting. Have you ever seen a housewife purchase over-age marshmallows, or a hard dry loaf of bread, or sliced sandwich meats which have curled at the edges or lost color by reason of loss of moisture, or cheese which has a hard crust all around the outside resulting from exposure? You see, when an excessive amount of moisture is lost from the product, the product is not merchantable. The housewife may be fooled one time, but when that happens the manufacturer and the retailer have lost a customer. It is, therefore, to the best interests of the manufacturer and the distributors and retailers to handle products according to the best methods and distribution practices. You may be assured that in 1958 both the manufacturer and the retailer are continually exploring every possible way in which fast distribution can be accomplished. Furthermore, a very great part of the problem involved in variations of weight has been solved by the im-

provement in packaging materials. Do you have any idea as to the amount of money that manufacturers of food and manufacturers of packaging materials have spent in research for the purpose of improving packaging materials, not only for the appearance of the package, but for the preservation of the food in good condition and to further reduce variations in weight which normally occur? I do not have a figure of the actual dollars spent, but I can tell you that it will run into many millions of dollars.

Further, with reference to the manufacturer, there is a built-in safety factor against excessive variations in the weight of packages. There are many cases in which retailers are charged with violating a statute or a city ordinance because of a shortage of weight in a packaged product. In many cases, the manufacturer may not be subject to the jurisdiction of the State or city, but, even if he is, many times the charge is not brought against him. However, even though the manufacturer is not charged with the violation, and even though it well may be that at the time of the manufacturer's sale to the retailer there was no violation, the manufacturer is vitally interested in the outcome of the charge against the retailer, because he must consider his continuing relationship with his customer. After all, the preparation, distribution, and sale of food is one of the most highly competitive businesses in the world. Therefore, for practical business reasons, the manufacturer may assume responsibility for his customer's weight cases in order to protect the retailer and to retain his good will. Obviously, the manufacturer will not retain his customer if his customer is continually in trouble because of weight problems involved in the handling of the manufacturer's prepackaged product. The manufacturer is not only vitally interested in having the proper type of law applied, *i. e.*, one which permits reasonable tolerances, but he must explain to his customer the difference between selling by weight and selling by the package and its effect when selling products subject to shrinkage.

In conclusion, I would like to point out that the consuming public of the United States needs the great variety of prepackaged foods which are available today, and it is incumbent upon the manufacturer and the weights and measures officials to work together to see that the consuming public has these foods and has them at honest weights. By honest weights, I mean marked weights subject to reasonable variations occurring due to loss of moisture. I believe most weight inspectors who go into the stores and checkweigh packages very soon learn to recognize the manufacturers who are trying to do a good honest job, as opposed to those who are intentionally trying to skirt or avoid the requirements of the law. Now I am an attorney for a meat packer. We employ the best weighing devices that money can buy. However, devices can go wrong. We employ human beings and they make mistakes. I would not have you think that my company does not have weight problems from time to time; when they occur, they are a source of embarrassment. However, I can advise you that my company is constantly alert to the problem, and responsible personnel follow a continuing program of checking equipment and urging care on the part of the employees.

Remember that the laws of most of the States governing weights of packaged product were enacted prior to the year 1925. At the time of the enactment of these laws, the weighing and packaging of prod-

uct were practically simultaneous in the retail store. Modern problems involved with prepackaged foods were virtually nonexistent. In spite of this, however, practically every State statute provides that tolerances be created. I quoted you part of a decision by a judge as early as 1924. The same principle has been incorporated in the Federal Food, Drug, and Cosmetic Act and regulations of the Food and Drug Administration, and the rule has further been adopted by a substantial number of State and local jurisdictions. I believe the Federal rule most nearly accomplishes the purposes for which net weight laws are enacted when you consider the necessity of having a law which protects the public, is fair to the manufacturer, and provides the public official with an efficient vehicle for enforcement.

(Mr. O'Meara illustrated his talk with appropriate slides.)

DISCUSSION OF FOREGOING PAPER

MR. R. N. SMITH: Mr. O'Meara, did I understand you to suggest that, although butter is labeled 1 pound and weighs but 15½ ounces, we should overlook the fact that it is a half ounce short because the housewife is going to get the full nutritional value?

MR. O'MEARA: That is not quite what I said. I said, assuming the package of butter weighed 1 pound when packaged, then any loss that occurs after that will be a loss of moisture and there will still be the same amount of butterfat in that package of butter as there was at the time it was packaged, in which case I think there should be no violation to consider. In other words, that would be a fair and reasonable tolerance. Now, if the package of butter is below weight in a sufficient amount to indicate clearly that it did not weigh 16 ounces when packaged, that is an altogether different story.

MR. MAHONEY: I am wondering if it would not be logical to say that, if a package is about a half ounce short at the time of sale, the customer would be shorted ½ ounce of butterfat, instead of ½ ounce of moisture.

MR. O'MEARA: That could be. But if the manufacturer overpacks to try to avoid that situation, his costs are greater and the housewife has to pay the greater cost.

MR. J. T. KENNEDY: We have found that, when a certain type of bologna is packaged at 2 pounds net weight, it will shrink as much as 4 to 6 ounces during the 10 days between the packing and the sale to the consumer. Do you think the consumer should be forced to stand such a loss?

MR. O'MEARA: I do not know whether 6 ounces in 10 days is excessive. It sounds excessive to me. It sounds as if that product did not bear the weight stamped on the package at the time it was packaged or you would not have had that much loss.

MR. KENNEDY: It was packed a full 2 pounds. In fact, we know that. It weighed the full 2 pounds when it left the packer. When it got to the dealer 24 hours later it was short. When it got to his stores it was short by a greater amount. The store managers put it on the counter for 14-day sales. Five days later the bologna was ordered off sale by a neighboring State.

MR. O'MEARA: Normally most meats do not lose much by evaporation of moisture the first two days. So if that product was short 24 hours after it was packed by any appreciable amount, it seems that it was not properly manufactured or packed.

MR. BOVIE: May I ask what would be your reaction if your wife came home with a package labeled 1 pound that actually weighed 15 ounces, and she told you, "The man told me that is all right. That is only the shrinkage between Chicago and my home."

MR. O'MEARA: With the knowledge I have, and assuming that 1 ounce is a reasonable shrinkage, I would have no complaint.

MR. SEARLES: Mr. O'Meara, there appears on many invoices of meat packers the following printed statement: "All goods in packaged form are sold at weight when packed; wrapped smoked meats are sold at net weight when wrapped; other wrapped meats are sold at weight taken after wrapping; sausage and cooked specialties in cloth bags are weighed after being placed in such bags and are so sold." Since we require the retailer to deliver his products to his customers at full net weight, would you not say it is proper that we protect him by seeing that the items he purchases for resale also be delivered at full net weight? What are the legal implications?

MR. O'MEARA: In my opinion the same rule should be applicable to the retailer and to the processor. If the processor is entitled to variations which occur due to normal loss of moisture that is inevitably encountered in good distribution practice, by the same token the retailer in the store who prepackages meat or any other product should be entitled to reasonable variations in weight that occur due to the loss of moisture after he has packaged the product in his store and placed it in his meat counter. Does that answer your question?

MR. SEARLES: No. My question pertains to the legality of meat packers selling certain of their products by gross weight.

MR. O'MEARA: I am not aware of that particular practice. In any event, it occurs to me that, in the instance you are talking about, the wholesaler or retailer dealing with the meat packer is purchasing knowing in advance what the conditions are. The conditions are taken into consideration in fixing the retail price of the product.

MR. DIMASE: Am I led to believe you are coming in here asking for a 15½-ounce pound, Mr. O'Meara?

MR. O'MEARA: What I am contending is that, assuming that a package which is stamped 1 pound in weight actually weighs 16 ounces when it was packaged at the packing plant or the other food processing establishment, if that package weighs something less than 1 pound at the time it is sold in the retail store it should not be considered a violation of the net-weight law. This is in accordance with the Federal rule, which provides and allows for variations in weight which occur due to loss of moisture which inevitably result in good distribution practice. Now, if the amount of that variation in weight is excessive, then that is a clear indication on the face of it that the package was not properly weighed at the time it was packed in the plant.

MR. COTTON: Considering a product that you know is going to lose weight by the time it gets to the retailer and that, by the time the consumer buys the product, is even more apt to be short weight, is it good distribution practice to package only the labeled quantity of that product?

MR. O'MEARA: In our opinion it is, provided we fully pack the product at the originating plant and the only loss that occurs thereafter is that which inevitably occurs due to loss of moisture in good

distribution practices. That means conveying the product by refrigerated rail car or truck. We consider that should not be any violation of the law.

REPORT OF THE COMMITTEE ON NOMINATIONS, PRESENTED BY G. L. JOHNSON, CHAIRMAN, AND ELECTION OF OFFICERS

The Nominating Committee submits the following report, including nominations for office in the National Conference on Weights and Measures to serve during the ensuing year or until such time as their successors are elected.

Consideration was given by the Committee to several factors in the selecting of nominees for office. Such considerations were geographical distribution, attendance records, Conference participation, and interest in promoting weights and measures.

The Nominating Committee now submits to the Conference the following nominations for office in the National Conference for the ensuing year:

For Chairman: C. M. FULLER, of Los Angeles County, California.

For Vice Chairmen: H. C. HULSHOFF, of Niagara County, New York; C. H. STENDER, of South Carolina; H. M. TURRELL, of Pennsylvania; E. C. WESTWOOD, of Salt Lake City, Utah.

For Treasurer: C. C. MORGAN, of Gary, Indiana.

For Chaplain: J. H. MEEK, of Virginia.

For members of the Executive Committee: The officers, *ex officio*, and J. F. BAKER, of Highland Park, Michigan; B. K. CUMMINS, of Honolulu, Hawaii; PAUL DeVRIES, of Passaic, New Jersey; A. E. DIAZ, of Puerto Rico; H. N. DUFF, of Colorado; J. P. McBRIDE, of Massachusetts; P. I. MORRIS, JR., of Georgia; W. G. SELLERS, of Mississippi; R. J. SILCOCK, of Vigo County, Indiana; W. B. STEELE, of Oregon.

(Signed) G. L. JOHNSON, *Chairman*,
ERLING HANSEN
H. E. HOWARD
W. A. KERLIN
C. A. LYON
R. E. MEEK
A. O. OSLUND

Committee on Nominations.

(The report of the Committee on Nominations was adopted and the officers were elected unanimously.)

FIFTH SESSION—AFTERNOON OF THURSDAY, JUNE 12, 1958

(C. D. BAUCOM, VICE CHAIRMAN, PRESIDING)

ADDRESS BY HON. P. C. BRINKLEY, COMMISSIONER, DEPARTMENT OF AGRICULTURE AND IMMIGRATION, STATE OF VIRGINIA, AND VICE PRESIDENT, NATIONAL ASSOCIATION OF STATE DEPARTMENTS OF AGRICULTURE

I am happy to have this opportunity to come up here and talk to you about one of my favorite subjects. I do not know any more important work we do in State Departments of Agriculture than weights and measures work. I do not know of many other jobs that affect more people or more products than weights and measures work.

Weights and measures means dollars and cents to the manufacturer, the wholesaler, the retailer and the consumer on the great majority of the products that are made and sold in this country. Let me give you just one example. In Virginia, we are just winding up a six-months check on the weight of fertilizer in bags. When we started checking six months ago, we found 28 percent violations. Last month, our violations were down to 4 percent. In other words, we saved Virginia farmers about \$1 a ton on a fourth of the fertilizer being sold in Virginia. That is a saving of about \$175,000 in six months, on just that one item. And that is more than our annual weights and measures budget.

But that is just one item. There are some other items we are not so anxious to crow about, because weights and measures is a big job. It is so big that the Federal government, the State governments, and the local governments can only get a spotty job done with the men and the money they have available.

In Virginia, we have doubled our weights and measures force in the last few years, but if we had three times our present force of 22 men, we still could not get the whole job done. And weights and measures is getting bigger and more important all the time. American industry is pouring out new products and new packages for old products every day. Back in the 1930's, the average supermarket had something like 500 items on its shelves. Today, the average supermarket has nearly 5,000 different items for sale, and a new one opened here in Washington a few weeks ago with 20,000 items for sale. The United States Department of Agriculture estimates that 20 percent of the items on supermarket shelves today were not even heard of just five years ago.

You know better than I do that with every new product and every new way of packaging or selling an old product, there comes at least one new weights and measures problem. This expanded and inter-related distribution system of ours is depending more and more every day on weights and measures. The whole system is built on standardization of the product, and weights and measures is the essence of standardization.

And while I am talking about weights and measures problems, we have no problems—new or old—that would not be solved with more money. But even with the money and the men we have, we do not have to make any apologies to anybody for weights and measures work. One of our inspectors went into a grocery store some time ago, and said: "I'm sorry, but I've come to check your scales." That in-

spector had two strikes on him to start with. He put himself on the defensive when he had no reason to. He was there on behalf of the people of Virginia, and he was there to help that grocer. He had an important job to do and a worthwhile job to do, just as your weights and measures men have.

You are trained professionals in an honorable profession. Nobody knows more about your job than you do. But unless you respect your job and unless you respect yourselves, nobody is going to respect you. You carry a big stick, so you can afford to be firm, and you can afford to be reasonable, but you cannot afford to be turned aside. You can temper justice with mercy—but you are doing yourselves and all those people who depend on you a disservice if you bend justice to suit expediency.

I have said that weights and measures work had no problems that more money would not solve. I wish I could give you a sure-fire way to get more money. The only way I know is to do two things. The first is to get out and get the job done. The second is to let the people you are working with know what you are doing. One is just as important as the other. In Virginia, we have approached this problem of letting people know what we are trying to do by setting up industry advisory committees in the fields where we had a particular weights and measures problem. We have had some pretty hot arguments in the meetings of these committees, but when the dust settled, we found two things. We found that we knew a lot more about the industry's problems and that as a result, we were much better equipped to do our job. And we found out that once the industry members saw that we meant to have weights and measures right, but that we would be fair and reasonable about it, they would cooperate with us. We also found that advisory committees would only work where both sides sat down together in good faith. But once a representative committee from an industry has agreed to a solution, it is just a little bit harder for any industry member to get up and criticize our program.

We have found that these advisory committees can be a real help with our legislature. We do not have industry men breaking down the doors of committee rooms to support our appropriations, but neither do we have active opposition. I do believe we can look forward to the day when industry groups will support more money for weights and measures work because they understand that weights and measures is serving them too.

But keeping industry informed is only part of this job of letting people know what we are trying to do in weights and measures. There is another fellow who ought to know what is going on in weights and measures and that is the Commissioner of Agriculture. The Commissioners have been taking more interest in weights and measures in the last few years, as illustrated by the fact that the last meeting of the National Association of State Departments of Agriculture passed a resolution calling for a Special Committee of the Association of Weights and Measures.

Don McDowell, Wisconsin's Director of Agriculture, who is president of the National Association this year, named me as Chairman of this new Weights and Measures Committee. One purpose in forming this Committee is to interest the Commissioners themselves in weights and measures work. I am going to do everything I can to help, and

I know the other Committee members will, but we cannot do much without you men who are actually working in the field. I cannot work up much enthusiasm in a man for something he does not know much about. So if you fellows will keep your Commissioners informed at home, I will try to keep them interested whenever they get together.

The second purpose in having this Committee is to really get something done about all of our weights and measures programs, and to get a little more uniformity in the way the various States go about doing weights and measures work. I have already written to the 36 Commissioners who have weights and measures work in their jurisdiction and asked for suggestions. Some of them said they would talk to you weights and measures men and write me. Some others said they would wait until after this meeting of the National Conference on Weights and Measures and talk to you. So it is up to you men. Unless you tell your Commissioners about your problems and stir them up at home, my Committee will not get much accomplished.

The members of the National Association's Committee are not specialists like you men are. We do not claim to know all the problems and all the solutions. But if you weights and measures men will go home and do the talking and the thinking, and get the details of your problems worked up, we will do our best to get action on them, and to get uniform concerted action.

The third purpose in setting up this Committee is to reinforce the working relationship that is illustrated by this National Conference on Weights and Measures. I like the philosophy of the Federal government doing the research and advising the States on methods and procedures and providing official uniform standards, and the States actually getting out and doing the field enforcement. And I think this arrangement has done a good practical job of enforcement.

The National Bureau of Standards and all of the States are going to have to stand closer together in the years just ahead, because of the enforcement job we are getting done. We have already stepped on some pretty big toes. Some national distributors who never had been bothered much by weights and measures men before are finding themselves in the squeeze between stiffer competition on the one hand and stiffer weights and measures enforcement on the other. The flour millers for example recently found themselves in this squeeze on small packages of flour. Two or three of the largest millers in the country decided they would repudiate the agreement that their own Millers National Federation had worked out three years ago with Federal and State weights and measures agencies on how flour packages should be checkweighed. They began working with their Congressmen to change the whole concept of weights and measures on interstate shipments. They wanted to put all the authority and responsibility for correct weight on interstate shipments in the Federal Food and Drug Administration—which is even more understaffed than weights and measures agencies—and take away all the authority of all the States on packages shipped interstate.

This idea strikes at the very roots of Federal-State relationships in weights and measures. I want to tell you weights and measures men here that we are just not going to let that happen. We are not going to let any special interests, no matter how big they are, wreck

the National Conference on Weights and Measures and break up Federal-State relationships that have existed for generations at one fell swoop.

And while I am at it, I want to say to you industry representatives present that I just would not take that approach to your weights and measures problems if I were you. The National Association of Commissioners will not sit idly by and let you drive that wedge.

I told you weights and measures men that your Commissioners have been taking more interest in weights and measures in recent years. Let me pass on to you some of my observations at our National Association meetings. I think they are true now, and I think they will be even more true in the future. The first one is that your Commissioner wants to know the facts about weights and measures. He does not want most of the dirt swept under the rug, because some day somebody will notice the bump and pick the rug up. Your Commissioner would rather defend a job you did do than explain away a job you did not do.

A weights and measures man or a Commissioner is in pretty good shape if the worst thing anybody can say about him is that he went out and did his job. A Commissioner would rather have everybody toe the line than worry about whose toes are being stepped on. He may have to handle a few hot ones to start with, but it is a whole lot easier on him in the long run if everybody gets the word that you mean business.

A Commissioner would rather back you up than have you back up—provided you are right and provided you have given a violator every chance to do right. As far as the people you deal with are concerned, you represent your Commissioner. If you back up, they figure he will back up too, not only in weights and measures but in other things.

These are not an easy set of commandments for weights and measures work. No job worth doing is an easy job to do. But it is the only way I know to convince the industrialist, the farmer, and the consumer that weights and measures is worthwhile. It is the only way I know to convince a legislature that weights and measures appropriations should be increased. It is the only way a weights and measures man can enjoy the greatest satisfaction that can come to any man—the satisfaction of a job well done.

There is a whole lot of this satisfaction in weights and measures work. If a man has a real desire to serve the people, weights and measures work is one of the best jobs I know. If he does not have a desire to serve, he does not belong in weights and measures work.

Let me leave you with this thought. There are only two sources of satisfaction in a weights and measures job—or in a Commissioner's job. One is the satisfaction of drawing a salary and staying out of trouble. The other is the satisfaction of a job well done. To my mind, there can be only one choice.

DISCUSSION OF FOREGOING PAPER

MR. CRAWFORD: Mr. Chairman, I commend the Commissioner for his remarks in regard to the findings that his men disclose concerning the weights of the bags of fertilizer in Virginia. Did you find that these errors in weights of fertilizer in bags was caused by the

inaccuracy of the scales or more by carelessness in filling and weighing the bags as they come off their filling lines?

MR. BRINKLEY: Frankly, we found both of those. We found in some cases there were scales that just could not be made accurate and we had to have them replaced. By and large, what we found was carelessness and sloppiness in weighing. We do not think we found any fraudulency.

MR. LEITHAUSER: I just want to say that I think the Commissioner of Agriculture from Virginia summed up this flour situation very well. There are times when we all do not think alike. We have differences of opinion. But regardless of those differences of opinion, I think on this flour situation we must all stand together and fight this thing as one man.

SYMPOSIUM ON PREPACKAGED COMMODITIES

E. L. RANDALL, State Sealer, Department of Weights and Measures, State of Nevada, served as Moderator during the symposium.)

CURRENT POSITION OF THE U. S. DEPARTMENT OF AGRICULTURE REGARDING THE LABELING OF PACKING HOUSE PRODUCTS

By J. R. SCOTT, *Chief Trade Label Section, Meat Inspection Division, Agricultural Research Service, U. S. Department of Agriculture*

It is a real pleasure for me to participate with representatives of industry, members of the Conference, and officials of the Food and Drug Administration in this symposium on prepackaged commodities. I have been asked to comment on the current position of the United States Department of Agriculture regarding the labeling of meats and meat food products.

Authority for our label control program is contained in Section 5 of the Federal Meat Inspection Act approved June 30, 1906. This section delegates broad authority to the Secretary of Agriculture which includes reviewing and approving labels before they are used in the inspected establishment. With the exception of the specific requirements that the label not be false or misleading and that only established trade names or names usual to the product be used, the language used in the law is quite general. This permits the Secretary to promulgate regulations to keep pace with merchandising practices and consumer expectancy.

Regulations promulgated under the Act prior to 1941 contained no requirement that the label bear a statement of quantity of contents. In 1938 Congress amended the Food and Drug Act requiring the label to bear the name of product, a statement of ingredients when the product is fabricated from two or more ingredients, the firm's name and address, and an accurate statement of quantity of contents. In 1941 the Meat Inspection Regulations were amended requiring the same labeling features and, in addition, it was required that the label bear the inspection legend and an identifying establishment number. On December 23, 1957, we amended our regulations by removing the statement of quantity of contents as a mandatory labeling requirement. Following the promulgation of this amendment, we issued Meat Inspection Division Memorandum No. 253, which states our current policy with respect to the statement of quantity of contents on labels. It reads as follows:

C. F. R. Amendment 57-76 of the Meat Inspection Regulations shall not be construed as permitting the omission of the statement of quantity of contents

from the label if such omission would render the label false or misleading. In reviewing labeling material for approval the following criteria will be used: Labeling material for product that has been conventionally packaged at uniform weight such as sliced bacon, frankfurters, wieners, pork sausage, sliced luncheon meats and the like and for canned product will not be approved unless they bear a net weight statement. Omitting the net weight statement from labeling for products that lose weight while they are being distributed from the establishment such as individually wrapped hams, pork shoulder picnics, pork shoulder butts, loaves, tongues, chunk sausage and the like would not be construed as rendering the label misleading.

Shortly after the 1941 amendment requiring the label to bear an accurate statement of quantity of contents, it was found to be impractical to apply the net weight statement of meat food products processed in casings, such as frankfurters, bologna, ham, and the like, and we found it necessary to exempt such products from the net weight requirements. As time went on, it was necessary to make additional exceptions to the net weight requirement in order to keep pace with new packaging and new merchandising practices. We found that such exceptions were not always in harmony with the Food and Drug requirements or with the requirements of the local and State weights and measures officials. Conversely, some of their requirements were not in harmony with the requirements of the Federal Meat Inspection Service. The Meat Inspection Act does not give us jurisdiction over labeling after the product leaves the official establishment. Many products shrink after they leave the official establishment, the amount of shrink varying depending upon length of time between labeling and offering it for sale, type of refrigeration, moisture content of the product, and type of packaging. It is obvious that the label for such products would be misleading when offered for sale even though it bore an accurate statement of quantity of contents when it left the packing plant. In many instances, the local weights and measures officials required such product to be remarked with an accurate statement of quantity of contents. We found ourselves involved in controversies between the inspected packer, Food and Drug officials, and local and State weights and measures officials, when obviously the controversy should have been between the packer and the jurisdiction which found the net weight statement to be inaccurate.

Since the packer is subject to the provisions of the Food and Drug Act, after the product leaves our jurisdiction, we felt that the packer, as well as the ultimate purchaser, would be better served if we removed the net weight requirement from our regulations. This permits the packer to deal directly with the particular jurisdiction having responsibility for the net weight requirements.

I hope I have clarified our position with respect to the net weighing of meat and meat food products prepared under Federal Meat Inspection.

DISCUSSION OF FOREGOING PAPER

MR. KERLIN: Could the last section of your memorandum be interpreted as providing that vacuum-packaged cold meats would be exempted from the quantity statement requirement?

DR. SCOTT: No, we would require the net weight statement on that type of package. If the package is vacuum packed, certainly it is not expected to lose any moisture.

MR. KERLIN: Are you familiar with the memorandum that the American Meat Institute sent to many of its members, in which it was stated that random weights of packing house products no longer need to be marked as to quantity?

DR. SCOTT: I believe that such a statement is not in accordance with this memorandum.

MR. R. E. MEEK: Does the Department require net weight statements on uniform or standard-size meat packages, and at the same time allow so-called "random" packages to be shipped without such a statement?

DR. SCOTT: The only exceptions are set forth in the last sentence of the memorandum, which identifies particular products for which quantity labeling material would not be approved. These include hams, picnics, pork shoulder butts, loaves, tongues, and chunk sausages. These are the only exceptions we have made.

MR. WRENN: With respect to the packages on which you do require a quantity statement, is the accuracy of this statement checked only as the package leaves the manufacturing plant, or is the statement required to be accurate when it leaves any distribution plant that is operated by the manufacturer?

DR. SCOTT: This new regulation does not exempt the packer from any responsibility. He still is responsible to the Food and Drug Administration, and he is also responsible to the State and local weights and measures officials. Certainly, as long as his product is in his establishment, whether it be the producing establishment or one of his other establishments that operate under Federal meat inspection, the statement of quantity on the products must be accurate at the time they leave the last plant. We have inspectors in those plants who will insist that a package be re-marked if it has lost weight while in storage.

MR. MARCOTTE: Dr. Scott, could you give us some indication as to what you would accept as reasonable variations at the time of your inspection for accurate weight determination?

DR. SCOTT: What is reasonable for one product might not be reasonable for another. Canned products, for example, should vary less than those that are not so packed. We know that a packer cannot hit a 15-ounce can right at 15 ounces each time; it might be a quarter ounce under, it might be a quarter ounce over. Our tolerances are the same as those of the Food and Drug Administration. The average of the quantities of contents of a given lot must equal the average stated net weight.

MR. EMERICK: I would like to ask Dr. Scott if it is not true that the invoice submitted to the retailer and covering items of packing house products purchased by him must contain a statement of weight?

DR. SCOTT: Yes, the invoice carries the statement of weight.

MR. EMERICK: Then I see no reason why the labels of these packing house products should not also be required to state the net weight.

DR. SCOTT: I believe that you will find that the net weight will be stated on such products shipped in interstate commerce, because the Federal Food and Drug Administration is going to require just that.

MR. EMERICK: You stated that there were, under your memorandum, certain exceptions.

DR. SCOTT: Exemptions only as far as meat inspection is concerned.

CURRENT POSITION OF THE FOOD AND DRUG ADMINISTRATION REGARDING THE
LABELING OF PACKING HOUSE PRODUCTS

By L. M. BEACHAM, Assistant Director, Division of Food, Bureau of
Biological and Physical Sciences, Food and Drug Administration

The Food and Drug Administration has discussed this subject several times with the Meat Inspection Branch. The most recent occasion related to the declaration of net weight on packaged meats. I believe Meat Inspection Branch is in agreement with our current view that packing house products in packaged form include wrapped meats come within the jurisdiction of the Federal Food, Drug, and Cosmetic Act when shipped in interstate commerce and must be labeled in compliance with section 403(e)(2) which requires an accurate statement of net contents.

In order to support this conclusion it is necessary to give a brief historical resume of the original Federal Food and Drug Act [34 Stat. 768]. That statute was enacted on June 30, 1906, the same date as was the original Meat Inspection Act, which was part of an appropriation bill. Section 8, Third, of the Food and Drug Act originally made it optional as to whether packaged foods contained a statement as to the net weight of the contents. Misbranding resulted only if such a disclosure was made, and it was not "plainly and correctly stated on the outside of the package." Because of the inadequacy of this "requirement," in 1913 the Gould Amendment [37 Stat. 732] to the Food and Drugs Act was passed making it mandatory for packaged foods to be "plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count." This section, however, was for some reason not deemed applicable by the Department of Agriculture to packaged meats [see 31, Opinions Attorney General 150 (1917).] Whether such attitude was based on the existence of the Meat Inspection Act is not known. [See testimony of Mr. W. G. Campbell before a Senate Hearing on S. 1944, 73rd Congress, December 1933: reported in Dunn, *Federal Food, Drug, and Cosmetic Act, Statement of its Legislative History*, page 1054]. Accordingly in 1919 there was enacted the Kenyon Amendment [41 Stat. 271] a rider to an appropriation bill, which proclaimed that "package" in Section 8, Third, mentioned above, "shall include . . . wrapped meats enclosed in papers or other materials as prepared by the manufacturers thereof for sale." As a result of this amendment it became clear that the Federal Food and Drugs Act rather than the Meat Inspection Act was to be applicable in so far as concerned weight statements on packaged meat products. In 1938 when the present Federal Food, Drug, and Cosmetic Act was enacted it was specifically provided in section 902(a) that the Kenyon Amendment, "defining wrapped meats as in package form . . . shall remain in force and effect and be applicable to the provisions of this Act." Since the Kenyon Amendment related only to packaged meats being included in the category of those items which must bear a weight statement, it is manifest that the Section 902(a) proviso of the present Act was intended to apply this requirement of Section 403(e)(2) to packaged meat products.

MR. KERLIN: Mr. Beacham, did I understand you to say that the Food and Drug requirements relating to labels on food products are in a statute that is an act of Congress, whereas the memorandum of the Department of Agriculture is a regulation?

MR. BEACHAM: That is correct.

MR. KERLIN: Then, in effect, no change has been made. There still exists the requirement that packages of food shipped in interstate commerce are required to bear a label including, among other things, a statement of the net contents.

QUANTITY CONTROL ON PRODUCTION LINES

By A. P. BOWMAN, *General Product Controller, Oscar Mayer and Company, Madison, Wisconsin*

This year commemorates the 75th anniversary of Oscar Mayer & Company in the meat packing and meat processing business. Have we learned in all of this time how to control quantity on production lines? Our answer gives us mixed feelings for we have learned much in the way of control, while at the same time we find that much more has to be learned.

When we attempt to confine ourselves to quantity control on the production line, we find that this seems to suggest an assembly line of automatic filling machines or a line of individuals sealing packages of sliced bacon. Unfortunately, such a connotation would oversimplify the subject of quantity control.

The production line as one may picture it is actually only a point or juncture in the total manufacturing operation. If we want to understand what quantity control really involves, we must stop momentarily at this junction point and reflect in retrospect at what series of events has led to it; and to increase our understanding, we must also look ahead and contemplate what occurs subsequently.

A quantity control program, as you will see, becomes truly effective only if a program of *quality* control is developed. By this I mean that one's sights must encompass the total panorama of a manufacturing operation. The perspective must of necessity be broad, simply because a finished product, such as a package of sliced bacon, a can of beans, or a loaf of bread, is what it is because of all the things that took place before it could be called a finished product. Furthermore, it is not enough to call it a finished product just because the last steps of actual manufacture have taken place and the company salesman has successfully contracted an order for sale.

"Finished product" is a relative thing. To the manufacturer it may be that product that is ready for shipment. To the retailer it may be that product that is ready for sale to the housewife. To the housewife it may be that product that is ready to use or to eat, in the case of food. Because of handling, natural shrink, and other causes which may affect the characteristics of the product, the so-called finished product may be different in the three instances, yet all three groups feel they are dealing with the same thing, and they have a right to feel that way.

One would think that quantity control involves simply a procedure whereby scaling of the finished product in the plant is done with accuracy and precision. Every food manufacturer would like

to have every package weigh exactly the same, but every food manufacturer also knows that this is a goal that is impossible of achievement, that variation in weight from package to package is as natural a phenomenon as the variation of heights and weights of people and that what he can do is to reduce the variation within the economic bounds of his business enterprise. In short, knowing there is variation is of little consequence, but knowing how *much* variation there is and knowing where it comes from give the manufacturer the key that unlocks the door to quantity control, to reduced underweight packages, to reduced overweight packages, and to general customer satisfaction.

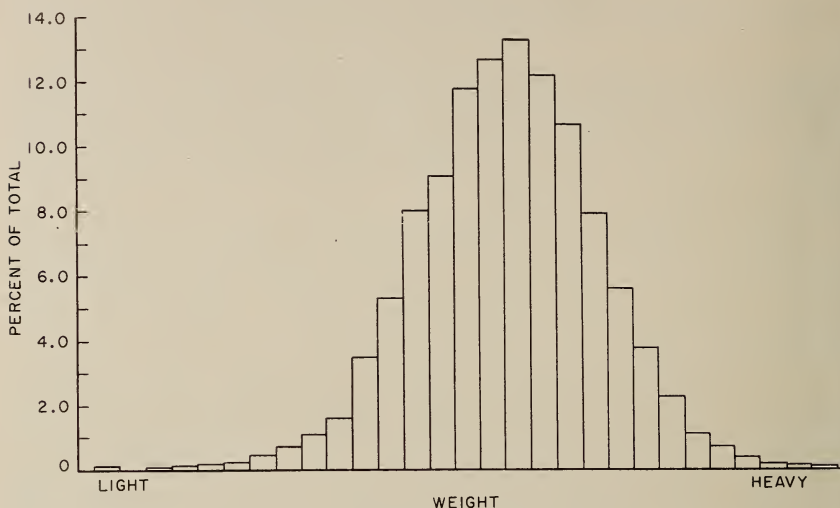


FIGURE 2. *Individual Wiener weights.*

The graph in figure 2 shows how individual wieners vary in weight during a period of time at one of our plants when operations are in satisfactory control. Notice that most of the wieners cluster around some central value while some wieners may be light and others heavy. I am sure that many of you recognize the shape of this graph as approximating what is called a normal distribution—shown in figure 3. This shape characterizes many phenomena in nature (such as heights and weights of all people in a large city) where an overall random effect has taken place due to the random combination of all forces acting upon the phenomenon.

Since a package of wieners usually contains a fixed number, say ten, you can appreciate that some knowledge of the individual wiener weights is needed if we want to understand the variation in weight from package to package. What lies behind this variability? First of all, we have the product itself. It has its own peculiarities of behavior, whether it is beans, bacon, or bread. The density, particle size, dimensions, uniformity of texture, and many other physical characteristics give that product a weight personality of its own that will dictate, whether we like it or not, what weight patterns it will have when it is packaged for distribution and sale. The impor-

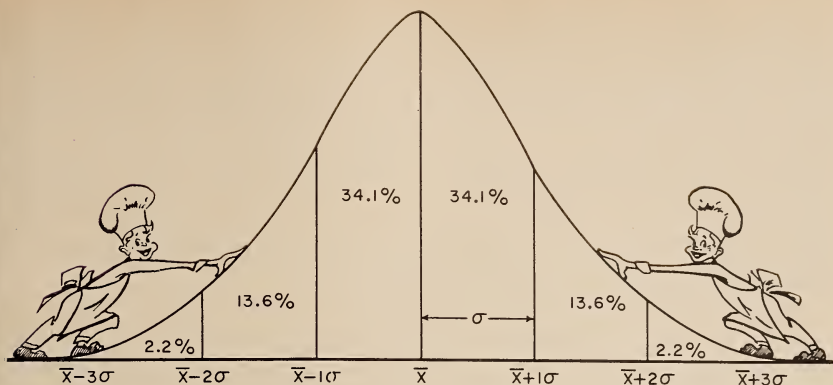


FIGURE 3. *The normal curve.*

tance of uniform raw materials is paramount if we want Monday's wieners to weigh the same as Tuesday's wieners, and so an extensive quality control program for raw materials is in effect to give us control of moisture, fat, and protein content. In the purchase of livestock, our control over initial variability is not quite as effective, and we are more dependent on processing controls.

The next thing we must contend with is the equipment—the great variety of machines that we use in making a product what it is to the customer. Each of these machines—scales, smokehouses, skinning machines, slicing machines, stuffing machines, refrigerated trucks, etc.—has a distinctive personality which makes it different from the next machine and, like people, may behave differently today from the way it did last week. The various characteristics which are inherent in each machine will also affect the weight pattern of the product being manufactured. Machine capability studies, then, are needed.

Let us not forget the people who handle and direct these materials and machines. The man who weighs raw materials to make a batch of sausage; the technician who reads meters and charts and adjusts smokehouses; the girl who neatly arranges the slices and packages a pound of sliced bacon—all have a distinctive attitude and aptitude that will help to determine the pattern our product will have when it is packaged. Effective education and training, not only in the way tasks are to be done, but also in the development of proper attitudes toward the job, are a necessary requirement for the total control that we have been attempting.

Finally, the particular and often variable way that materials, machines, and men are utilized in combination has in itself a unique character that will also modify the weight pattern. For example, how much time should we permit a scaler to spend on a package of bacon? The more she spends, the better the control; the closer the tolerance, the lower the overfill but the higher the labor cost. The balance between labor and overfill is an economic decision specific for any company. We must remember also the fact that we are dealing with a highly perishable commodity subject to many kinds of deterioration under a complex of conditions.

These forces I described to you—men, materials, machines, and methods—do not act independently of each other but necessarily interact because of their mutual dependence. For example, if product is not properly handled while it is being shipped, normal shrink becomes excessive and an underweight problem is present. When all of these forces are acting upon our product, the result is that the net weight of each package is different from the rest. Weights simply vary from package to package, and we must accept the fact that they do vary. With acceptable operating procedures taking place, the net effect is a random one, and the pattern of variation of weights assumes the “normal” pattern shown to you earlier.

By the use of established statistical techniques, called statistical quality control, or simply S.Q.C., we can measure this variation in weight of the finished product and detect any major and often minor changes that have taken place in the pattern of variation we can expect under good operating conditions. These methods raise warning flags when men, materials, machines, methods, or any combination of them has gone awry somewhere. Appropriate action within the economic bounds of manufacture usually correct the difficulty before serious proportions are reached.

These techniques are extremely effective. We have had a weight control program at Oscar Mayer and Company based upon S.Q.C. techniques for more than seven years. We have been able to reduce very effectively the variability in weights from package to package which has enabled us to reduce the average overfill while at the same time minimizing the percent of underweight packages. It is a source of amusement to me, as well as pride, that some of the MIB inspectors in our plants keep a sharper eye on some of our weight control charts than we do.

An overfill, which is defined as an excess in weight above the marked weight of the package, is more important in perishable products than it is for products which are not as affected by air. Where we have products packed in air-tight film, such as our sliced meats are, shrink is no problem. It is necessary for all products to have, on the average, a slight overfill, because this recognizes the inherent variability in the product and counterbalances excessive underweight packages.

Knowledge of the natural shrink characteristics after packaging as well as knowledge of the variability are needed in order to determine what overfill average should be established as a standard. Maintaining this average through S.Q.C. sampling techniques will assure us that underweights will not be a problem even after product is held in the package for a given number of days. For example, we have found that a pound of sliced bacon will lost from $\frac{1}{32}$ to $\frac{2}{32}$ ounce in 9 to 13 days, which is less than $\frac{1}{2}$ of 1 percent and that the rate of shrink is quite independent of whether the package is kept in a shipping cooler or in a self-service showcase, provided that the relative humidity and temperature are the same. Hence, an average overfill was established so that no package would be underweight by more than $\frac{2}{10}$ ounce even after 23 days. Such control can be maintained only when other circumstances of production and distribution are adequately controlled. This is shown in Figure 4.

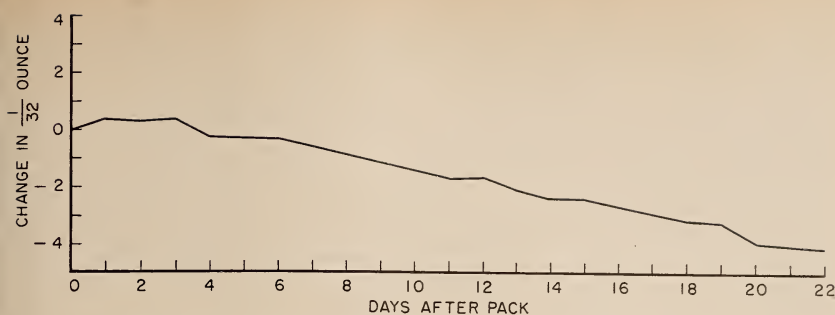


FIGURE 4. *Average loss in weight—1 pound sliced bacon.*

Sliced bacon usually consists of 20 to 25 percent moisture. In the case of pork sausage, which contains 35 to 40 percent moisture, the shrink problem is more critical. Our studies indicate that a one-pound package of sausage links loses about $\frac{3}{32}$ ounce in weight in the package at four days after packing. This is about $\frac{6}{10}$ of 1 percent. This represents about the maximum time this product is held prior to shipment. Because of these shrink characteristics, it was concluded that a low average overfill for this product at the time of packing was a potentially hazardous practice and so a standard overfill was established to assure us that the average percent of underweight packages would run about five percent.

The problem of natural shrink must be attacked in several ways. Information obtained on the shrink behavior of the product will help to determine the maximum age limit for shipping so that the percent of underweights at the time of delivery does not violate Federal or State regulations. Stores where our products are sold must be constantly serviced by our salesmen in order that a proper rotation of stock is effected. Equipment used in transport must be kept in good condition. The design and quality of cartons and packaging materials must be of the highest available calibre. And the manufacture of the product itself must be subject to adequate controls at all stages. You can see that men, materials, machines, and methods must be understood in their totality if an effective job is to be done on weight control.

By reducing the variability we can reduce the average overfill without increasing the amount of underweight product. This means a savings to the company, part of which can be passed on to the consumer. It has paid us to the tune of better than nine to one to invest in an extensive S.Q.C. weight-control program. By combining statistics, probability, and industrial engineering investigations, our entire scaling program has been improved.

Any action that can be taken to keep a complex manufacturing operation in good control is usually determined by the economic bounds of the enterprise. I should explain this further. After the inherent variability in a process is determined, we know that certain things can be done to reduce it. We can keep the scales continually in adjustment, we can improve the training program for the scalers, we can keep the slicing blades sharp and in adjustment. These are but a few examples. Now when these things are done, and we still find excessive variability in terms of what is

desired, action must be more drastic, and much more expensive. It may require replacing large stuffing machines, reorganizing the entire method of manufacture, or some such major overhaul. The extent to which a manufacturer may go is dependent upon how worthwhile he feels it would be to him economically. He may find, for example, that to decrease the overfill of a product by $\frac{1}{100}$ ounce and also reduce the variability he would save \$100,000 a year. This may necessitate, however, an overhaul of his production line to accommodate new machines, and this may involve millions of dollars of investment. Like most of us, he lives with what he has, makes the most of it, on the basis of the best available knowledge, and improves his lot when he can afford it.

I do want to impress you with the fact that a weight control program should be only a part of, and should be a reflection of, a total quality control program. Quantity control alone is like a sentence out of context—you can miss the important points. For this reason all of our quantity control personnel are a part of the more-inclusive product control department.

We have every reason to exert continued effort in these respects. Good weight control pays dividends to a manufacturer in many ways. First of all, there is the moral obligation to our retailers and to our customers to give them what they pay for. Business is people, after all, and most of us want to be, and try to be, fair in our dealings. This basic relationship, integrity, forms the backbone of all of our business activities. There is also an economic obligation to ourselves as businessmen, stockholders, and providers of employment, which good weight control can help to fulfill.

I have attempted to present some highlights of processing problems to enable you to see the broad outlines which set the pattern for a solution of a rather complex problem. I hope I have impressed you with the fact that this approach to weight control, namely, statistical quality control techniques in a total quality control program, is worthwhile to us as manufacturers, to you as weights and measures officials, and to all of us as consumers.

DISCUSSION OF FOREGOING PAPER

MR. CICHOWICZ: Did I hear correctly that your company does overpack on some items on which you anticipate shrinkage? And if so, would you please elaborate on that?

MR. BOWMAN: Yes, we overpack in terms of normal handling. We attempt to anticipate the time the product will be in our stock, the time en route, and a limited time in the retail store.

MR. HOWARD: On the problem of shrinkage in the store, you stated, I believe, that stores where your products are sold must be constantly serviced in order that there will be a proper rotation of stock. How is this handled?

MR. BOWMAN: We cannot, of course, guarantee that our products will sell within a certain time limit. However, our salesmen are instructed, and we enforce this as rigidly as we can, that they are not to sell more product than they feel the store can move in a reasonable time. The salesmen further are instructed to work with the storekeepers to see that the stock is properly rotated—that is, that the stock that arrived several days ago is sold before the stock that arrives today.

STATE AUTHORITY IN PACKAGE CONTROL

By ALFRED D'AURIA, *Deputy Attorney General, Department of Law and Public Safety, State of New Jersey*

It seems clear that everybody concerned with the problems existing in the field of weights and measures recognizes that shrinkage in food products is a reality. Nobody denies the great convenience to the average American housewife of prepackaged products. Nor does anyone disagree with the proposition that to deliver to the retailer and ultimately the housewife or other consumer a prepackaged product "honest" in weight and measure is, under some circumstances, a difficult task for the wholesale manufacturer, canner, distributor or whatever you wish to call him. Nevertheless it should and must be accomplished.

It seems clear that the purpose of the laws of weights and measures is to protect the consumer. Were we to relax our standards simply because compliance is difficult, we should be defeating the purpose of those laws. Similar problems arise in other fields of law. For example, difficult also is the task of interstate railroad companies in protecting their employees and passengers from injury. Equally difficult is it for manufacturers of products other than food stuffs to protect the general public from injuries resulting from defects or imperfections in those products. In order to bear the burdens of protection, those persons must resort to research and the various scientific methods, equipment, and other aids which are made available to them through such research, frequently at great expense and effort. But do it they must. And it is our position in the State of New Jersey that the manufacturer and the wholesale distributor of food products, even though they may be engaged in interstate commerce, must deliver to the retailer and the consumer in New Jersey a product "honest" in weight and measure.

We are confident also that the claimed difficulties are exaggerated. Everybody knows that shrinkage occurs. And it is possible by resort to past experiences, scientific studies, and the use of scientific instruments and methods to predict with a fair amount of accuracy the amount of shrinkage which will occur in any given package. We do not accept the statement that an unpredictable and uncontrollable amount of shrinkage will occur even where good distributing practices are followed. Good distributing practices should include sufficient allowances for shrinkage so that the package, when obtained by the consumer from the retailer, will be within the tolerances prescribed by the State in which it is marketed.

But, we are told, the tolerances are not uniform throughout the nation. In some States none is allowed. Well, we all agree that uniformity would be ideal. But until it is obtained, the manufacturer and distributor and retailer must adapt to its absence. Perhaps the answer is that the packaging should be accomplished to conform to the statute or regulations of that State which is the least liberal of the forty-eight. But whatever the solution may be, conformity with the regulations in New Jersey will be required.

To say, moreover, that strict compliance is expensive does not impress us. Our view is that the housewife or ultimate consumer is entitled to receive at the time of purchase substantially the product which is advertised. Whether the housewife seeks a value of nutrition or a given amount of weight is irrelevant. If the product is

advertised by weight, that is the basis on which it is purchased. If it is advertised by amount of nutrition, that is the basis on which it is bought. If it is advertised as being eight ounces in weight, that is what the consumer expects to receive, and that is the standard to which the manufacturer, distributor, and retailer will be held. Where added cost is incurred, we have an economic problem. And perhaps the solution is in passing along at least part of that added cost to the consumer. Most consumers—and so the legislature of our State has doubtlessly concluded—would prefer, at a slightly increased cost, to be sure of what they are receiving than to gamble, at less cost, on whether they are receiving full measure.

The argument that to require a distributor to adhere to fixed standards of weights and measures is to make it economically unfeasible for him to remain in the market is not convincing. It is no more convincing than to say that to require railroads and other public carriers, manufacturers of hard products, and operators of other businesses to observe certain standards of care towards their customers and the public generally will drive them out of business. The law of supply and demand will assert itself in any event. And basically all we are asking is that the seller simply tell the buyer how much he is getting for his price.

Now, whether or not for the State of New Jersey to administer its laws and regulations in this manner is violative of the United States Constitution may be an open question. It is our position, however, that to do so does not constitute an unreasonable restraint on interstate commerce. It is not discriminatory. It does not deprive anyone of due process of law. Nor does it conflict with any Federal law. We treat all alike: residents of New Jersey, residents of other States, residents and citizens of other nations.

Nor do we feel ourselves bound to accept the tolerances adopted by the Federal government or any other State, as has sometimes been suggested to us. The standards most beneficial to the State of New Jersey, we hold, must be determined by the legislature of the State of New Jersey, not by the Federal government or by the legislature of any other State. To do so is fully within our police powers and is in no way discriminatory or disruptive of interstate commerce. As the United States Supreme Court said in *Cloverleaf Butter Co. v. Patterson*, 315 U. S. 148, 62 S. Ct. 491 (1942), with which you are all familiar, I am sure,

The argument that it is improper to infer a restriction on confiscation of material when confiscation of product is permitted fails to give weight to the difference between a confiscation which interferes with production under federal supervision and confiscation after production because of a higher standard demanded by a state for its consumers. *The latter type is permissible under all the authorities.* (Italic ours.)

And later in the opinion,

But, of course, if any of the finished product is offered for sale in Alabama, such product becomes immediately subject to the requirements of the pure food laws of that state.

Interesting also is the strong dissent in that case in which Chief Justice Stone, and Justices Murphy, Frankfurter, and Byrnes said they felt the State statute involved was valid even though there was a Federal act in the field.

Since the purpose of the laws of weights and measures is to protect

the consumer, we can hardly justify watering them in order to accommodate the producer, particularly where we are convinced that the producer has the means at hand to comply with those laws as written and enforced. When the State legislature decides that the plight of the producer is greater than that of the consumer, it will act to rectify the situation. But until that happens, the laws will be strictly enforced in New Jersey, just as are our motor vehicle regulations. And until a court of competent jurisdiction decides that our laws of weights and measures or our methods of administering them are unconstitutional, we have no recourse but to assume that they are perfectly valid.

All we demand is that when the retail consumer receives a package in his local outlet, that package be of the weight and measure as represented. If it is not, we shall enforce the law. We shall certainly enforce it against the retailer and, if he is available, the manufacturer or distributor.

DISCUSSION OF FOREGOING PAPER

MR. POWERS: I contend that the housewife is entitled to the 16-ounce pound marked on a package and not a "packed" weight. If we tolerate the delivery of less than that, we are neglecting to do our duty. In the State of Pennsylvania, we insist on a net weight content. That is a cause to which we are dedicated. I think every man in the weights and measures field is dedicated to the cause of fair merchandising and a fair measure of profits to the merchant and a 16-ounce-to-the-pound to the consumer.

MR. KERLIN: I believe Mr. Bowman is the only man who has addressed us so far at this Conference who has said that his company does allow for anticipated shrinkage and does overpack. He said a product may be four or five days in their plant, several days in transit, and then they also allow for a given time in the retail outlet. I think that this should be done by all packers of food products who can expect moisture loss before the final sale to the consumer.

MR. BOWMAN: Our company policy recognizes that there are two types of obligations. There is a legal obligation and a moral obligation. The legal obligation is met by controls that set the minimum standards. We also have a moral obligation. The job of the quality controller is to see that we do not just meet the minimum requirements as set by the laws. No elaborate program of quality control is needed to meet the minimum, because we have the meat inspection people and the weights and measures people who will keep us in line there. But we must go over and above that and meet the moral obligation that each manufacturer has to his consuming public.

MR. CRAWFORD: I would like to ask Mr. Bowman why food packers are able to justify high costs for developing and using these attractive packages when they apparently are unwilling to stand comparatively low costs to overpack to assure full weight to the consumer.

MR. BOWMAN: I would like to take first the subject of the cost of packaging. The packages are expensive. But let us consider a package that my company developed through many years of research and take a look at what was behind the development, why the money was spent for the package, and what it gives the consumer; because, after all, you will not sell a package if you do not give her something.

Several years ago we worked with Dow Chemical to modify a film for food use. This film is now on the market in the grocery stores, well advertised as Saran. In about 1948 we came on the market with a sauce and product packaged in Saran. Saran is a rather expensive film, but it has some very unique characteristics. First, it has excellent visibility; Mrs. Housewife can see what is in the package. Secondly, it has a zero moisture transmittal; the product will not shrink in the package. Third, it has a very nearly zero oxygen transmittal. What does that mean to the housewife? It means that we can put a product that formerly had a shelf life of eight to ten days in a film, ship it to her, and give it to her in a factory-fresh condition. It has exactly the same flavor, texture, chemical composition as it did when we put it in the package.

Now, let us look at this as it affects weight. At very high speeds we can fill this tube with a tolerance of $\frac{2}{32}$ ounce and produce no lightweight packages. What have we done for the consumer? We are giving her the fairest weight that she ever had in a product that has substantial moisture. She is paying for it. She is paying for the convenience, she is paying for the flavor, and she is paying for the weight control, because a company does not stay in business just to service the people it sells a product to.

This can be contrasted with the entirely different problem presented in the packaging of wieners. Here we have a shrinkage problem. We have a problem in variability of the individual units. We are packaging wieners per pound at $\frac{10}{32}$ to $\frac{14}{32}$ ounce over marked weight. There are many reasons why that is necessary. One is the shrinkage in transit. Mrs. Housewife is also paying for that overfill. The housewife who gets a package that has shrunk to exactly 16 ounce pays the same as the one who pays for $16\frac{1}{2}$ ounces. Thus, the consumer who pays for the 16-ounce package is, in a sense, being cheated. Legally, of course, she is not, but morally she is cheated. So we are constantly at work on our wiener operation to reduce the variability so that morally we cheat no one.

REPORT OF THE COMMITTEE ON RESOLUTIONS PRESENTED BY A. R. FRASSINELLI, CHAIRMAN

MOISTURE DETERMINATIONS FOR GRAINS

Whereas, the accurate determination of the moisture content of grains and other agricultural products is of great economic importance because moisture content is a factor in determining the prices at which such products are marketed; and

Whereas, a plurality of instruments and methods are currently in use for determining the moisture content of grains and other agricultural products: Therefore be it

Resolved, That this 43d National Conference on Weights and Measures request the U. S. Department of Agriculture and the National Bureau of Standards, working jointly, to investigate the subject of moisture determination of grains and other agricultural products, to the end that accurate means and methods for this purpose be developed and that uniform specifications, tolerances, and testing methods be established for the instruments involved in such determinations.

SUPPORT OF THE NATIONAL BUREAU OF STANDARDS

Whereas, criticism has recently been directed to the weights and measures activities of the National Bureau of Standards and particularly to the activities of the Bureau's Office of Weights and Measures, because of the character of technical and administrative assistance being given to State and local weights

and measures officials, and specifically because such assistance has included technical training in areas and methods officially recommended by the National Conference on Weights and Measures: Therefore be it

Resolved, That this 43d National Conference on Weights and Measures express its belief that the many forms of assistance rendered by the National Bureau of Standards to State, County, and city weights and measures organizations throughout the United States comprise a potent and constructive force in promoting uniformity and increasing efficiency in weights and measures administration throughout the country, and that such assistance should be increased rather than diminished: And be it further

Resolved, That this Conference record its support of the Director and staff of the National Bureau of Standards in this outstanding example of a worthwhile Federal-State cooperative effort in a technical area, directed to the common good.

WEIGHTS AND MEASURES WEEK

Whereas, the signal success that attended the effort to promote a National Weights and Measures Week in 1957 has been most gratifying to the membership of the National Conference on Weights and Measures; and

Whereas, it is believed that much good will result from the periodic repetition of such concentration of attention on weights and measures activity: Therefore be it

Resolved, That this 43d National Conference on Weights and Measures enthusiastically endorse the idea of an annual National Weights and Measures Week and record its recommendation that officials and representatives of business and industrial agencies having weights and measures interests cooperate in planning in advance for and conducting such "Weeks" in succeeding years: and be it further

Resolved, That a suitable emblem for Weights and Measures Week be developed by the National Conference Committee on Education, to which end all those having ideas for such an emblem are invited to forward their suggestions to the said Committee on Education.

TRAINING SCHOOLS

Whereas, numerous weights and measures jurisdictions throughout the United States have derived great benefit from the weights and measures training schools that have been planned and conducted for them, at their request, by representatives of the Office of Weights and Measures of the National Bureau of Standards; and

Whereas, these jurisdictions are deeply appreciative of these efforts of the Office of Weights and Measures and believe that they should be continued and expanded for the general good of weights and measures administration in this country: Therefore be it

Resolved, That this 43d National Conference on Weights and Measures express its concurrence in the sentiments expressed by these jurisdictions that have already profited from the assistance of the Office of Weights and Measures in the training of their personnel, and that Mr. W. S. Bussey, Chief of the Office of Weights and Measures, and his staff be thanked and commended for this constructive contribution to enforcement efficiency: and be it further

Resolved, That a copy of this resolution be sent to Dr. A. V. Astin, Director of the National Bureau of Standards.

STANDARD-SIZED PACKAGES

Whereas, the National Conference on Weights and Measures has for many years believed firmly in the principle of standardized sizes for packaged commodities; and

Whereas, the Conference further believes that substantial advantages will accrue to those who package commodities, from adherence to this principle; and

Whereas, the Conference further believes that standard-sized packages offer one of the best forms of protection to the consuming public in the area of intelligent evaluation of their purchases from the standpoint of the quantities involved: Therefore be it

Resolved, That the 43d National Conference on Weights and Measures strongly urge upon manufacturers and packers of commodities adherence to the principle of packaging in standard sizes according to a simple schedule of self-defining units, with the elimination, as rapidly as practicable, of the multiplicity of "odd" sizes now prevalent that involve fractional parts of

basic units and offer competitive sizes differing in content by relatively slight amounts, to the confusion of the prospective purchaser.

DECEPTIVELY LABELED FOOD PACKAGES IN INTERSTATE COMMERCE

Whereas, it is understood that the Federal Food and Drug Administration is now handicapped in its enforcement of legal requirements with respect to the deceptive labeling of packaged foods in interstate commerce, by reason of inadequate funds and personnel for carrying on this program; and

Whereas, the weights and measures officials of the United States are of the opinion that needed protection to the general public would be provided, and that their own enforcement programs would be greatly aided if the Federal enforcement program with respect to deceptive package labeling could be fully implemented: Therefore be it

Resolved, That this 43d National Conference on Weights and Measures respectfully urge that every effort be made by the Federal Food and Drug Administration to obtain an allotment of funds such that it can conduct all needed studies and investigations in the broad area of the labeling of food packages moving in interstate commerce, and undertake and prosecute a vigorous enforcement program in this area: and be it further

Resolved, That this National Conference offer the assistance and cooperation of its membership in all ways in which these officials can be of help to the Federal Food and Drug Administration in the studies, investigations, and enforcement program that are requested by this resolution.

Resolutions of appreciation were adopted as follows:

1. To Honorable Sinclair Weeks, Secretary of Commerce, for the assistance rendered to the Conference by the U. S. Department of Commerce and for his personal contribution to the program.

2. To the officials of the Federal Food and Drug Administration and of the U. S. Department of Agriculture, who made possible tours of their respective laboratories.

3. To officials governing weights and measures agencies for their cooperation in facilitating attendance at the Conference.

4. To business and industry for cooperating with the Conference, for attending and participating in its activities, and for hospitality extended.

5. To contributors to the program.

6. To Dr. W. Mühe for his interesting and instructive contribution.

7. To the Director and staff of the National Bureau of Standards for the assistance in planning and administering the program and other details of the meeting.

(The report of the Committee on Resolutions was adopted by the Conference.)

BREAKFAST MEETING OF THE INCOMING EXECUTIVE COMMITTEE OF THE CONFERENCE, FRIDAY, JUNE 13, 1958

On Friday morning, June 13, the newly elected Executive Committee, the chairmen of the standing committees, and the weights and measures members of the Advisory Committee met to discuss and reach decisions regarding the 44th Conference. Present at the meeting were six of the nine officers, all ten of the Executive Committee members, the chairmen of the three standing committees, and the chairman and the two weights and measures members of the Advisory Committee. The meeting was presided over by the newly elected Conference Chairman, Mr. C. M. Fuller, Los Angeles County, California. The following decisions were reached regarding the 44th National Conference on Weights and Measures, 1959:

1. *Place:* Sheraton-Park Hotel, Washington, D. C.
2. *Date:* June 8-12, 1959.
3. *Duration:* Open committee meetings on Monday, opening session Tuesday morning, Wednesday afternoon free of any scheduled business session, and the remainder of the week scheduled according to the program plans.
4. *Meeting starting time:* Tuesday, 10 a. m.; Wednesday, Thursday, and Friday, 9:30 a. m.; all afternoon sessions, 2 p. m.
5. *Registration fee:* The committee voted unanimously that the registration fee be increased to \$10.00. The registration fee was increased in order to provide funds for necessary travel of committees for interim meetings. Such travel is to be administered by a "Travel Finance Committee" made up of the Conference Chairman, four Vice Chairmen, and Treasurer.

SIXTH SESSION—MORNING OF FRIDAY, JUNE 13, 1958

(J. P. McBRIDE, Chairman, Presiding)

(At the suggestion of Mr. R. W. Searles, the Conference stood in silent tribute to the memory of Matthew D. Ribble, a long-time member of the National Conference, who passed away in 1957.)

OPEN FORUM—ADMINISTRATIVE PROBLEMS

SELECTING AND TRAINING NEW INSPECTORS

By A. E. DIAZ, *Head, Weights and Measures Division, Economic Stabilization Administration, Commonwealth of Puerto Rico*

This time I appear on your program with a deeper feeling of gratitude, because with your assistance our Office has made a good start towards the higher levels of achievement fostered by the National Bureau of Standards.

As was acknowledged by the Economic Stabilization Administrator in a recent letter to Mr. Bussey, Chief, Office of Weights and Measures, National Bureau of Standards:

The reorganization of the Puerto Rican Weights and Measures Division got off to a good start when Mr. Smith was here in 1955, and has just received a valuable impetus from a most fruitful two-week training school conducted by Mr. Jensen and Mr. Wollin.

Unquestionably, the Training School has been a success. The representatives of the National Bureau of Standards accomplished a great deal in conveying technical knowledge by way of lectures, demonstrations and actual practice—and in creating good employee morale through their enthusiasm, inspiration, and friendliness, too!

In view of the significance of the human element, we started our reorganization by recruiting additional field personnel to be thoroughly trained before going into the field.

Let us now go into the breakdown of the subject.

At the end of the fiscal year 1957 we had available seven positions for field inspectors. The candidates, according to the Office of Personnel, should at least be high school graduates, not older than 35. They should have some experience as investigators or should have worked in any other job that has to do with the public. To these requisites we added that the candidate must own a car or should be willing to buy one for use in official business, inasmuch as the government does not provide transportation facilities to each inspector. Of course, mileage is paid for the use of the vehicle.

Considering these requirements and qualifications, we asked the Employment Service Office of our Labor Department to provide us with applicants to fill the seven positions for weights and measures inspectors. After several interviews we wound up with a selection of a group of young men, alert and physically fit, the majority of them with two or more years of college training. All of them were advised that they would be subjected to a thorough training and that they would have to complete satisfactorily the training period in order to be certified as regular employees.

The training started in August 1957. First we familiarized them with the different weighing and measuring devices and their design, construction, and operation, as presented in National Bureau of Standards Handbooks 37 and 45. We had full cooperation from the local distributors of weighing and measuring devices, who loaned us their equipment and even provided us with technical personnel for lectures and demonstrations.

Then we conducted a thorough discussion on the theory of inspecting and testing weighing devices. National Bureau of Standards Handbook 44 was extremely valuable in the application of specifications, tolerances, and regulations.

We did the same thing with the measures and measuring devices. Whenever necessary, the classroom was moved to the field, as in the case of gas pumps, vehicle tanks, and meters.

We also went into the study of laws and regulations. Unfortunately, during that time we were still working with pieces of legislation considered to be obsolete, and inadequate for carrying on the present program. The same applies to most of the regulations in force. As we reported to this Conference last year, a bill based on the model law on weights and measures was presented at the Legislature. We hope that within the present session the bill will be approved, and then the new regulations promulgated.

With the assistance of our Legal Counsel, talks on the preparation of cases for prosecution were delivered to the trainees. Under this subject, special attention was given to rules of evidence, wording of the complaint, and conduct of the officer in court. In our Agency there is a close tie between the Legal Division and the Weights and Measures Division. For example, in case of violations to weights and measures laws or regulations our office has been using the services of a special prosecuting attorney appointed by the Department of Justice from the staff of our Legal Division.

The responsibility of the weights and measures inspectors in public relations was emphasized and the inspectors were urged to play this role with all their enthusiasm. By now our inspectors stress the educational aspects and resort lastly to judicial action.

When our personnel was ready to go to the field, each one was assigned a specific area to inspect and test all the weighing and measuring devices commercially used in Puerto Rico. The inspectors worked under the direction of the field supervisor.

So far we have been dealing with the trainees, but how about our staff of veteran field inspectors? Did the training effort of the new inspectors impress them? This, in my opinion, is most stimulating.

The old staff of inspectors have been on service from 3 to 24 years. As we were dealing with a group of men with a long experience in weights and measures, I thought that they would resent and resist to be subjected to a training program. Because of this consideration we decided to start with the newcomers.

We should answer now the question stated before. Did the training effort of the new inspectors impress the veteran inspectors? Were they impressed! It was a matter of demanding the same rights as the trainees. Yes, opportunity to receive instruction, to discuss procedures, and, furthermore, opportunity to get acquainted with National Bureau of Standards Handbook 44.

I have never been as wrong as when I thought about resentment and resistance. There we were with a group of experienced inspectors positively anxious to follow procedures. With the stage set up, we started the training program for our veteran inspectors.

Periodical meetings in small groups permitted us to carry on the training program without interrupting the field operations. As we were making progress everyone seemed to be more conscious of the importance of being properly qualified for the job and the personnel

insisted on having additional training sessions. Most of these sessions were conducted on the basis of open discussion among the participants. After the close of each session one thing was evident—the necessity of continuing the periodical meetings for orientation, general discussion on procedures, interpretations of laws and regulations, and other aspects of the enforcement program.

In the training effort we mainly emphasized uniformity in procedures. Up to that point, we had been holding meetings with the participation of only part of the field staff at a time. We thought that a meeting including the whole staff would be more effective for obtaining the desired results. We also considered that it would be very helpful to obtain the assistance and guidance of the Office of Weights and Measures of the National Bureau of Standards in conducting a training school in Puerto Rico. We discussed this matter with them, and it was last February that we had with us Messrs. M. W. Jensen and H. F. Wollin opening a two-week training school. The program presented during those two weeks was most interesting and profitable. Our personnel, as you know, is Spanish-speaking and the classes were conducted in English. But this was not very much of a handicap. Some of them did not know the right words in English, but they used everything they had to put their ideas through. Both Wollin and Jensen had the opportunity to evaluate how much our inspectors got from their lectures and demonstrations. The recommendations submitted by Mr. Jensen in his report covering the training school were most enlightening.

Although we have a good start, we still have a long way to go. It is the feeling of the group that the training effort should go on. I am pleased to quote one of the inspectors who said: "We are enthusiastic students of weights and measures; we need to learn and we are eager to go on learning."

DISCUSSION OF FOREGOING PAPER

MR. TRUE: Mr. Diaz, how many scales, for example, do you expect your men to test per day or per month or per year?

MR. DIAZ: We have not set such standards.

MR. TRUE: Do you have in mind a figure representing about what you think they might do in a certain period of time?

MR. DIAZ: We have no such figures.

MR. HARRIS: In your training school, how hard was it for your men to learn to understand Handbook 44?

MR. DIAZ: It was not too easy, and it required study. But I believe that, in spite of the language difficulties, they now have a reasonable command and understanding of the handbook. This was demonstrated all through the examinations that were held.

SELLING WEIGHTS AND MEASURES TO TOP GOVERNMENT OFFICIALS

By C. M. FULLER, *County Sealer of Weights and Measures, Los Angeles, California*

Looking back over a career in weights and measures, there are some things that stand out above all others. It matters not when they took place. Some of the most vivid memories may be those of events that happened in the early days.

Of course, you made many mistakes. This is bound to happen when you are a young fellow, just out of college, and this is your

first job. You have had no practical experience with people and situations. You have to learn the hard way—and you stub your toe more than once. But you were lucky. The gods were with you, and none of these mistakes were serious enough to jeopardize your job. They did cause enough headaches and wakeful nights, however, so that the same mistake did not occur a second time.

It took a butcher knife within an inch of your chest to impress you with the necessity of making sure that the owner of a place understood who you were, and what you were there for, before starting to make an inspection. In this case, the butcher was visiting with someone in the doorway of his shop and paid little attention when you stated your name and business—just nodded his head in an absent-minded way. So you went behind the counter and started to unpack your grip of test weights between the scale and the cash register. About that time, there was an angry bellow, and you found the butcher looming as huge as a bull, ready to shove a knife in your ribs. The manner in which you jerked your coat open to show the brass badge of a Sealer while you frantically, although in a rather shaky voice, yelled to stop a minute, would have been extremely funny to anyone else. He did stop, and there was no damage done. The reason for his sudden action was that the place had been robbed recently and he did not intend to see it happen again. You can be sure that this oversight on the part of the Sealer did not happen again.

One day, the morning newspaper came out with the following headline in bold, black type: "COUNTY SUPERVISORS TRUMPED BY SEALER OF WEIGHTS AND MEASURES." The story related how the Board of Supervisors, in a wave of economy, had proposed to lay off part of the deputies in the Department of Weights and Measures and return half of the money in its budget to the general fund. Before taking this action, however, they did give the Sealer an opportunity to appear before them and state his cause.

The Sealer was ready for this meeting. He displayed scales that weighed incorrectly, and packages that were shortweight. He reminded them that the department had been created by the demand and vote of the people themselves. He called their attention to the small cost to the individual for a service that protected him every day of his life—and saved him many times that amount. He was talking for the life of a department and for a service that he believed in. He put everything he had into that speech and demonstration. And the result? The Supervisors reversed their stand, and instead of taking away from the Department, actually increased its working budget.

I shall be eternally grateful to the reporter and city editor who published that story. From that time on, the Supervisors took a personal interest in our work, and you can bet that we kept them informed. Service clubs and women's organizations wanted to hear more about weights and measures, and a cycle of public speaking began that has continued to this day.

Now, to take up some of the things that have been most significant in building a high regard for the Department with the general public as well as with public officials. It goes without saying that you must be doing a topnotch job and thoroughly understand your work.

That automatically instills a feeling of confidence and enthusiasm that is priceless—"Nothing is going to stop you now!"

Nobody comes into close contact with as many people as does the Sealer. His name is well-known, for it is printed on the paper seals that are placed on each scale or pump. Whether he is remembered with a friendly feeling or not, depends on the manner in which he conducts himself.

It is not enough, when entering a place of business, simply to identify yourself. If the dealer is a newcomer, explain the purpose of the inspection; that it is both for his protection and for that of the public. Scales can weigh against him. Small errors multiplied by many weighings amount to large sums. Explain the regulations. Encourage him to ask questions. Invite him to call on the Department whenever he has a problem concerning scales, filling and marking packages and containers, or other matters pertaining to weights and measures. Leave him with the feeling that you have a friendly interest in his affairs—and you have made a booster for the Department.

Remember this. The majority of top public officials are elected officers. They are very conscious of their constituents. They do not want to be annoyed by complaints about their departments if these can be avoided. They want to hear good things. And they support the official who has the goodwill of the people. It helps make their positions more secure. Your success depends upon their confidence in you.

Once in a while, you will run into a dealer who is in a vile mood. Maybe he has a hang-over from the night before. Perhaps everything has gone wrong that day. Or he may be a chronic grouch—a genuine stinker. This calls for a lot of self-control, but it is worth the effort. Do not get mad. Do not be supersensitive and take his attitude as an affront. Keep cool and let the fellow talk himself out. Learn to take it. Nine times out of ten, he will begin to feel ashamed of himself and wind up by being your friend.

When it is necessary to prosecute an offender in court, be courteous but firm. Make it clear that there is nothing personal in the action. Under your oath of office, you have no alternative.

We mentioned public speaking at the beginning of this talk. You can make it one of the most productive and interesting parts of your work. It is inspiring to meet with organizations, get acquainted, enjoy their fun during luncheon or dinner, and then arouse interest and gain more boosters for weights and measures with your talk. If it is needed, join a toastmasters club or take some lessons in public speaking. You will never make a better investment.

Watch for opportunities to make yourself better known. During the last world war, many of us were chairmen of consumer interest committees, or of salvage committees. Assume leadership in charity drives or other worthy enterprises. Be the president of your toastmaster's club. You will meet many people, and you are bound to receive favorable publicity.

And speaking of favorable publicity—that is something top public officials rate highly, for they well know its value. So, do not overlook any opportunity to obtain it. Get acquainted with local newspaper men and keep them supplied with human-interest stories about some of the unusual incidents that occur from time to time. Exhibits,

especially if some ingenuity is used in their planning, offer a rare chance to interest large groups of people.

And, finally, do not make the mistake of contacting the top officials who control the finances of your work only when you want something. See them whenever you have something interesting and worthwhile to discuss. Let them know what your Department is doing for the people of their districts. Then, when you do need something, your request is much more likely to meet a favorable response.

Now, I realize that there is nothing startling about these suggestions. But do not sell them short. They simply are rules of conduct that have met with success, and will always meet with success. Try them out.

KEEPING LAWS AND REGULATIONS MODERN

By V. D. CAMPBELL, *Supervisor, Division of Weights and Measures,
Department of Agriculture, State of Ohio*

If I were to send out a questionnaire with but one question on it, and that question were to be "What is the one greatest weakness of weights and measures administration and enforcement today?" no doubt a variety of answers would result. For example, there might be the answer, "need of more money for operation, salaries, etc." Another might be, "a fuller and more thorough training program." Other needs would be listed, too.

But, if you will think seriously of what it is the most basic needs for proper enforcement, you might well discard other needs—urgent and real as they are—for the need of adequate laws and regulations to meet the demands of today. You might well disagree with me, but that is honestly my opinion.

I hope all of you have read the article, "Elements of Weights and Measures Control in the United States," by W. S. Bussey, published in the April 1958 issue of the Scale Journal. If you have not done so, get a copy and read it. It is a MUST.

This article points out that there was a time in our history when accurate standards were the prime need. Through the years, that problem has been pretty well resolved by means of Acts of Congress which made it possible for States to have accurate standards and through the National Bureau of Standards, which agency is authorized to "compare standards used in scientific investigations, commerce, etc." Furthermore, the Bureau is authorized to exercise its functions for not only the United States Government but also for State governments. Thus we have a reliable agency to which we can turn and must turn, legally, to determine the accuracy of our standards; whether they be "brand" new or comparatively old.

Not only does the Bureau assist us in maintaining the accuracy of standards, but, through its Office of Weights and Measures, the Bureau makes available handbooks for study and reference, personnel for training and instructing State and local officials, films for our use, and every possible cooperation. You cannot have been a weights and measures official very long without knowing this and also appreciating this ever-present source of help.

There is one thing which the National Bureau is NOT! It is not a law-enforcing agency. The problem of securing adequate laws and regulations is very definitely "our baby" and we cannot "disown" it.

But with accurate standards available for our use, the problems of securing uniformity of enforcement, reliable and valid methods of testing, and adequate laws and regulations were not solved. Through the National Conference and its committees, and the advice of the National Bureau, suggestions have been available to us for the past several decades. And through the years, many of these laws and regulations have been enacted or adopted to a large extent by the various States. To be sure, there is variation among States, but it seems to me that greater uniformity is gradually being achieved.

However, if we examine the present laws and regulations which each of us has, most of us realize that they are inadequate in some instances, and in other instances there are "loop-holes." Many of these laws and regulations are old now and were, at the time of passage or promulgation, adequate.

There are many reasons why these laws and regulations were not kept "up to date." But this is not a "post-mortem" examination. How can we go about getting them where they should be? There is no question but what most of us here have an adequate basic framework upon which to build. Through the National Bureau and the National Conference, "grist" or "food" for building upon this framework is handy and available.

There probably is no specific method by which any one of us can wave a "magic-wand," say "presto-chango" and have it accomplished. It will take study as to what objective or objectives we seek, and then a plan to achieve these objectives, and then hard work.

The bringing of laws up to date can follow two general schemes: (1) a general overhaul of all the laws and (2) the enactment of new laws covering a specific subject or amendments to existing law. The securing of amendments to old laws is the easier, and in all probability the most desired. In the case of each State, there will have to be determined what type of legislation to submit to the legislature, and this will depend upon the individual circumstance.

Once the type of legislation is decided, it will be well to have conferences with those industries concerned to explain fully what the need for the legislation is, what is being proposed, and how it would effect them. If there are any "bugs" in such proposed legislation, it might thus be wiped out before legislation is begun. Once a bill has been introduced, and is being heard by a legislative committee, any opposition which might cause a doubt to be raised in the mind of the committee might easily kill the bill, regardless of how good it is. This is true whether it be new legislation or amendments to old law. I cannot stress too strongly the need of "eliminating" opposition before attempting to "legislate." May I cite an example, several years ago Ohio sought to change the fill-point of milk bottles from the cap-seat to $\frac{1}{4}$ inch below the cap-seat (as stipulated in Handbook 44). It was necessary in Ohio to change the law. We had submitted to the Ohio Dairy Products Association a statement of what we were going to do and asked for their consideration. However, we did not go to the trouble of seeking a meeting with the Executive Committee of that organization and "talking-it-out" with them. Hence, when the hearing on the bill took place before a House Committee, some dairy distributors were able to "kill" the bill by means of raising a doubt in the mind of the committee as to the need of this legislation and as to whether or not a hardship would

result. At the next general assembly, a similar bill was introduced and, with several members of the dairy industry speaking for it, the bill passed without opposition. Why did it pass the second time? An effort was made to fully acquaint the industry as to just what our objective was. This was done with individual members of the dairy industry, as well as with the appropriate committees of the Ohio Dairy Products Association.

For the past several sessions of the Ohio Assembly, weights and measures legislation has been introduced. In most instances, the measures were passed. In two instances, the measures had to be introduced in succeeding legislatures. The "½ inch below" cap-seat was one of these two. The other was the adoption of Handbook 44 on a statutory basis.

In some instances, compromises will have to be accepted—and in some cases these might well be desirable. But if all the "bugs" and "compromises" can be worked out ahead of time, there is a much greater chance of securing the desired legislation.

In the past, most of the legislation secured was of the "amendment to present law" variety. However, at the last session of the Ohio General Assembly, a resolution was sought and passed that the Legislative Service Commission study all the weights and measures laws to bring them up to date. The commission studying these laws consists of seven house members and two senators, and these legislators are now studying the laws.

When the work of this commission is completed, two "omnibus" bills will probably be drafted and submitted to the General Assembly. One of these will include all changes that are non-controversial (so far as we can tell) and the other will contain those changes about which there might be some controversy. Hence, if the latter bill gets held up, the former has a good chance of passage.

The kind of legislation, and the machinery for getting it through, will vary, of course, from State to State. Then, too, consideration should be given to the legislator who will be asked to introduce the bill. The more influential he is, the better chance of success you will have.

Most States have State weights and measures associations. These associations can be most helpful in securing needed legislation. They can well be the key to success. In Ohio, the Ohio Sealers' Association has generally been the sponsoring agency. When using the association, it is well to have as the chairman of the legislative committee a man who can speak well, and by all means, to keep this man on the job over a period of years. In this way, the legislators come to know him.

The head of the State Department under whom you work, must also be thoroughly informed as to the proposed legislation. He can be of great assistance to you not only with the legislature, but also with the Governor—who will certainly want a briefing on the bill. The opposition of a State Department can go a long way toward "killing" a bill.

Many of you have had as much and probably more experience than I in getting needed legislation. At the proper time, give this Conference a report on your plans that have been successful.

The matter of keeping regulations up to date will probably offer many different types of approach. In Ohio, for example, there was

a time when a Department Head could promulgate regulations without any hearing, publicity, or restrictions. Today, however, we have what is known as the "Standard Administrative Procedure Act" which sets up the machinery for getting regulations promulgated. This will, again, vary from State to State. We are required to have publicity, public hearings, etc., before any regulation can be officially effective. Experience has shown us that if we have an "informal hearing" with all concerned, suggested changes can usually be worked out before the official formal hearing is held. In this way, both time and money are saved.

The need for modernization of regulations is probably more important right now in the various States than is the need for legislation. May I cite this example. Most States have laws covering the labeling of prepackaged goods. These laws are not too unlike each other, in that they provide for a statement of net contents, and also provide for regulation as to exemption of small packages, and reasonable variations. Most of these laws follow the U. S. Food and Drug Laws as to food labeling or the Model Law suggested by the National Conference.

Where does this need for variations arise and how serious is it? Certain commodities such as meat will shrink, while other commodities such as flour may lose moisture or gain it, depending upon storage and other conditions. Regardless of whether or not we like it, we are going to have to make provisions for such variations if we are going to be realistic.

The Federal Food, Drug, and Cosmetic Act made this provision, among others, by regulation:

... variations from the stated weight or measure shall be permitted when caused by ordinary and customary exposure, after the food is introduced into interstate commerce, to conditions which normally occur in good distribution practice and which unavoidably result in change of weight or measure;

Many State laws make it mandatory that some such variations be promulgated by regulation. **THIS IS MOST IMPORTANT.** Unless some provision is made to recognize these variations, when the law requires it, any court action based on short weights in packaged goods would fail. It is that serious.

Recently, the Office of Weights and Measures of the National Bureau of Standards sent out a questionnaire relative to State regulations on packaged commodities. I do not have the results, but I am confident that the survey showed that a great many States are not modern in this particular type of regulation. Ohio is no exception. I do not stand up here with completely clean hands in this regard. But I would like to tell you that events since our last Conference have made it imperative that each of us go home, study our regulations, and take steps to make them meet the demands of today.

For your information, the Model State Regulation for Package Marking Requirements reads as follows:

... variations from the stated weight or measure shall be permitted when caused by ordinary and customary exposure, after the commodity is sold and delivered by the manufacturer, packer, or distributor, to conditions which normally occur in good distribution practice and which unavoidably result in change of weight or measure.

MR. W. I. THOMPSON: Do you have any procedure for avoiding conflicts among the different departments or agencies in your State when you are attempting to get additional legislation?

MR. CAMPBELL: We have not encountered such conflicts. The legislation we have sponsored has been of interest solely to the Department of Agriculture; various divisions of the Department may be interested, but cordial relations exist among these divisions, and there has been no friction.

MR. STENDER: Has there ever been a test case in Ohio as to whether rules and regulations have the same force as law?

MR. CAMPBELL: No, probably because it is mandatory, not permissive, for our Director to issue regulations—the law says “shall,” not “may.” Moreover, the Director is not a legislative agent and can promulgate a regulation only when there is law to back it. If we go to court, the action is based upon the law rather than upon the regulation.

MR. BUSSEY: As to the use of “shall” or “may” in the law, at least one court has indicated that in either case it is mandatory upon the department to promulgate the regulations referred to.

MR. WRENN: Mr. Campbell, we have heard much about production or work units for inspectors. I do not agree with the idea, and think that production units are out of place in law enforcement. Do you believe that quality is better than quantity?

MR. CAMPBELL: We have never used production units to set up work quotas for our inspectors, and I know nothing about the system.

MR. BUSSEY: We know of a few jurisdictions that have set work quotas for their inspectors based on production units, and there seems to be some trend in that direction as a result of so-called efficiency studies.

MR. KERLIN: We worked up some work load units during the past year, and they are dynamite.

MR. J. G. WILLIAMS: One purpose served by production units for weights and measures tests is to give the public an actual cost basis for the services they receive. In Richmond we have been successful in operating a performance type of budget. By careful study we have been able to fix for the testing of each weighing or measuring device, and for the supervision of prepackaged commodities, the average time required. We have determined that, out of a regular 8:30 a. m. to 5:00 p. m. work day, after allowance has been made for necessary travel and other unproductive time, only a little more than 3½ hours remain for productive work. With a good knowledge of the number of testing operations and the amount of package checking to be performed, we are then able to compute the number of inspectors required to fulfill the legal requirements for frequency of testing. Such information enables us to justify before our Budget Bureau our requests for personnel.

I may represent a small minority, but I do think that production units, if associated with productive and unproductive hours, give a helpful view of a work program and make possible fair work assignments. We have 5 inspectors and have determined what we can expect of each man. Each inspector is given a quarterly assignment, and he can work it out as he sees fit.

MR. W. I. THOMPSON: Do you have any difficulty, Mr. Campbell, in getting your laws enacted in simple, clear, and concise language?

MR. CAMPBELL: We draft most of the bills ourselves, and, as a result of the conferences held prior to the introduction of a bill, attended by representatives of trade associations and other affected parties, any lack of clarity is brought to our attention and corrected. So when the bill reaches a legislative committee, there are few, if any, questions as to its meaning.

FOLLOWING THROUGH ON CONFERENCE ACTIONS

By M. A. NELSON,¹ *Chief, Division of Foods and Standards, Department of Agriculture, State of Michigan*

I firmly believe that all participants in this very important annual National Conference on Weights and Measures should follow through after returning to their respective duties and continue to do everything possible to accomplish the objectives of the action officially adopted by the Conference. I think it is the duty of every weights and measures official in the Nation to do what he can within his jurisdiction to promote uniformity by bringing about the successful conclusion of any action adopted by the members of their Conference.

Of course, sometimes there is the problem that some local ordinances, regulations, or laws might prevent action in your particular jurisdiction until some changes were made by legislation, but I still feel that the action of the Conference should be given full consideration by the interested persons in your jurisdictions. I think that this is not only a desirable procedure for weights and measures officials, but it should also apply to every *industry* affected by any of the action adopted at this Conference.

Furthermore, to successfully accomplish the actions adopted by this Conference, we certainly need the wonderful cooperation, assistance, and services always rendered by the head of the National Bureau of Standards and members of his staff. Too often I think we may fail to realize the wonderful job that has been done by the personnel of the Office of Weights and Measures in the National Bureau of Standards by keeping us properly informed in regard to the many problems that we encounter. They should be highly complimented for rendering us such extremely technical and vitally important assistance and for maintaining the close relationship and understanding between the National Office in Washington and all of the weights and measures officials throughout the United States.

Sometimes it appears that the people in industry do not understand the responsibilities of the personnel in the Office of Weights and Measures in the National Bureau of Standards. They, too, must see that we all follow through on "Conference actions." I believe some of the people in industry have not given the proper appraisal to that part of their duties that has been in effect for many years. The weights and measures officials of the Nation have looked to the Office of Weights and Measures of the National Bureau of Standards to keep them informed as to important phases that must be taken into consideration in the successful carrying out of the Conference actions.

¹ In the absence of Mr. Nelson, made necessary by urgent official business in Michigan, this paper was read to the Conference by Miss Margaret Treanor, Secretary, Michigan Association of Weights and Measures Officials.

Just in the last four or five years I have seen several instances of where considerable study was given to a particular problem that was to be solved by industry and weights and measures officials working together. Recommendations were made to the National Conference when it was in session. Everything seemed to be agreed upon as far as the efforts that were going to be made by everyone to bring out a successful conclusion of the work that had been done to assure the buyers of certain commodities that they would get the weight declared on the containers. Then some persons from industry who were responsible for carrying out their part of this project seemed to have missed the main objective or changed their minds. The latter group proceeded to criticize very unfairly officials who were doing their duty by "following through on Conference actions."

I could elaborate on other examples of how we meet at this National Conference annually, thoroughly discuss problems pertaining to weights and measures, adopt the action to be taken, then someone does not perform his duty by "following through" after the Conference is over. We must all keep continually trying to bring our actions to a successful conclusion.

For example, several years ago it was definitely decided by this Conference on the recommendation of a committee that had given it considerable study that some particular effort should be made to require all seeds to be sold by net weight. Of course, some States have had laws for years requiring all commodities to be sold by net weight. My State has had such a law for 112 years, and I think it is highly desirable. But I want to mention that we continue to find the seed industry selling seeds gross weight by including a bag that certainly brings a whole lot more money by being sold as seed than it would if sold as just a bag!

At that same Conference, the Resolutions Committee reported and recommended the adoption of a resolution that the Conference go on record favoring the sale of meat by net weight because evidence had revealed the practice of the sale of meat by gross weight. That resolution was adopted by the Conference, but did we follow through on it? Meat may not be sold legally by gross weight, but there certainly have been many instances before and since that Conference where meat would still have failed to meet the weight declared on the shipment or containers even if it had been by "gross weight" instead of "net weight."

This Conference action on gross weight is a typical example of the need for a lot more "following through on Conference actions," because another Committee of this Conference at the 40th National Conference in 1955 again introduced a recommendation that the Conference go on record as condemning the sale of meats by the packing industry on the basis of gross weight and the methods of invoicing or billing their trade by such weight. Again the Conference adopted the same recommendation as adopted previously, but apparently some phases of the meat industry did not follow through. They have not successfully brought their operations into compliance with the recommendation or with the law. I think this is a case where it might be well for industry to do their best to "follow through" as well as for the weights and measures officials.

Then we might mention the work that this Conference did on the farm milk tank project. This Conference, and particularly the

National Bureau of Standards personnel, did a lot of research work before we finally adopted the specifications, tolerances, and regulations that apply to the farm milk tank. I believe weights and measures officials (AND A LOT OF THEM) followed through to the best of their resources. But, it is rather surprising to see how industry—at least some persons or firms interested in the manufacture and sale of these tanks—has failed to comply or even familiarize themselves with the specifications and tolerances for these measuring devices. Months after manufacturing and delivering these devices, they suddenly become aware of some of the requirements as far as the specifications are concerned. There again I think industry in some instances failed to follow through. In addition to that, too many other groups interested in the farm milk tank program failed in their communications with weights and measures officials, not realizing (evidently in spite of all the publicity) that a farm milk tank that was calibrated was a measuring device.

At the 1955 Conference, the Committee on Methods of Sale of Commodities also had the Conference go on record as condemning the use of such terms as “jumbo,” “giant,” “king size,” “Texas pint,” etc. Again there is evidence that we should all follow through—not only weights and measures officials but industry—in stamping out these misleading terms when used in promoting the sale of various commodities. Just in the last few weeks, a national television program has been sponsoring the so-called “Giant Quart” and “Giant Pint” in the sale of a certain commodity, but investigation will reveal that the so-called “Giants” were just ordinary U. S. quarts and ordinary U. S. pints. There are many other instances of similar misleading weights and measures terms being used daily throughout the United States.

Just recently one firm engaged in the sale of popcorn and potato chips in consumer packages had the proper net contents declaration on the containers by ounces avoirdupois of popcorn, but in large letters it declared that the package contained “two gallons of popcorn.” Of course, when the packer was warned of this misleading statement, he started to quote several makes of dictionaries for his authority, but I told him I thought the weights and measures officials throughout the United States would insist upon the net contents declaration being in the appropriate terms of U. S. standards.

I think industry should follow the same course in developing its programs for quantity declarations. Selling dry commodities by liquid measure is in about the same category as determining liquid measure by weight. It is even about as ridiculous as the man who determined the weight of the cattle he sold by putting a tape around their bellies. We had to stop that one in the State of Michigan!

In the years gone by, Conference committees have put a lot of work and effort into bringing in their recommendations which have been discussed in detail by Conference members in official sessions. These reports have so often been adopted after thorough discussion but still have been ignored by other groups and organizations. We have also had instances where codes and specifications have been written by other groups with only implied relations to the weights and measures field but never with the prior knowledge nor a conference with weights and measures personnel about the preparation of much of this material. Our Committees have strongly recommended that

all persons engaged in preparation, development, or promulgation of codes relating to weighing and measuring devices or practices where commercial quantity determinations may in any way be involved, consult with the appropriate committees of the National Conference, and submit the appropriate section of such codes to the Conference for a study and comment. But still, even though that recommendation was adopted by the Conference, it has not been followed through by industry. If industry would follow some of those recommendations adopted by the Conference, they would assure more harmony and better results than they would in attacking weights and measures officials for doing their duty, and criticizing the laws that are intended to protect everyone as far as quantity determinations are concerned.

I think industry should quit trying to make excuses about the cause of short weight by blaming it onto moisture content. They seem to want to have the net weight declaration on the package recognized as being legal regardless of shortage all the way from the point of origin on the date of packing from points half-way around the world and months of intervening time. They seem to expect those declarations to be recognized by weights and measures officials at the time of sale regardless of the experience of those packages. I do not think that citing a multitude of court decisions by the legal profession will settle the discrepancies in the net weight declaration of commodities when they are offered for sale.

We found it necessary recently in my State to reweigh hundreds of packages of boneless meat that originated in Sydney, Australia, about three months ago and that averaged 5 percent short weight. I do not think the buyer should be penalized because the product had traveled such a long distance and took such a long time to arrive, and then have claimed it was just the moisture. How do we know?

Another example I cannot refrain from mentioning at this time is the fact that one of the important committees reported at the 42d National Conference last year that fresh frozen halibut fletches were found to be short weight. The processor had included the weight of the ice along with the net weight of the fish. We all know that that is a matter that needs attention, as far as the enforcement of our local weights and measures laws and regulations are concerned. The report of the committee on that subject was adopted by the Conference. I think every weights and measures official present and every member of industry was aware of the action of the Conference and the problem. They should have followed up the proceedings of the Conference by giving the matter their attention in their own jurisdictions and in their own groups, but we will probably continue to find the problem existing. That is why I think we should continue to "follow through on Conference action," because I know, as far as my own jurisdiction is concerned, we continue to find too many shipments of not only fish but other food products that have included not only the weight of the ice but even the weight of the ice after it melted in the net weight of the products involved.

Of course, some phases or segments of industry appear to be particularly concerned about the consumer in their purchases of commodities that are determined by weight or measure under our present system. Some representatives of food packing industries would appear to indicate that we should discard this whole system of buying

and selling by standard weights or measures. We often hear the excuse about some products being hygroscopic, indicating that moisture is involved. If we weights and measure officials had to follow some of their suggestions, it would be necessary to have a chemical analysis made of every article of food being offered for sale to see how much moisture there is left in it as if that were a plausible excuse for its being short. Perhaps if more study were given to properly weighing the product and preserving its condition when it was prepackaged for sale, it might maintain its true character through some of these long periods during which it was waiting for someone to dispose of it.

I have heard some representatives of industry argue that we should adjust our weights and measures laws and the enforcement of them in order to protect the packer who is putting up products in foreign countries. They indicate that the enforcement of some of our laws was oppressive. I may be from the old school but I still think that every buyer should expect to receive the quantity represented as declared on the containers or invoices.

I have recently seen and heard the statement that "the weights and measures laws are primarily designed to protect the consumer." The weights and measures records for my State for the year 1957 would seem to refute the idea that the laws were placing the wholesale packer in an "intolerable position in his packing and distribution of so-called 'consumer packages'." Out of 142 convictions obtained in Michigan by State Weights and Measures Inspectors, *only five* were against wholesale packers for products in consumer packages; 48 convictions were of short weight sales to retailers and other wholesalers; 81 convictions of retailers prepacking their own consumer packages; and 8 for miscellaneous weights and measures violations.

I may have formed a wrong impression of these laws when they were first brought to my attention rather forcibly over fifty years ago, but I think that they were intended to protect *every person* buying or selling commodities by weight or measure. The laws would seem to apply to every purchase or sale in the channels of trade, beginning with the first seller through to the ultimate consumer, and I believe many weights and measures officials will agree that many short weight or measure commodities can be found all through the marketing channel. If that were not true, why have we equipped ourselves with large-capacity testing units, including trucks for checking large-capacity scales, and other equipment for testing wholesale liquid-measuring devices?

Some shameful short weight violations have recently been revealed in this regard, including the boneless mutton from Australia which averaged three pounds short on every 60-pound box, and sales of dressed poultry to the military services that averaged five pounds short on every hundred pounds delivered. Some industry representatives worry so much about the "poor consumer" and the retailer, but it would be interesting to see if the retailer who is engaged in prepackaging his own purchases before selling to the consumer could make things come out even when putting up such packages from short weight purchases. I know of several wholesale distributors of meat on a local basis who would have had quite a chore to break even on weights in distributing to their retailers about 275

pounds of veal that were delivered to them weighing only about 225 pounds!

So, let us confine our weight problems to a reasonable variation, and I am one of those who feels that there should be permitted a reasonable variation. As far as my own State is concerned, we have a regulation that provides for a reasonable variation. That regulation does not give the specific tolerance, but I think weights and measures officials are very understanding when it comes to what is considered "reasonable." I have even seen some figures that the meat packing industry considers as being unreasonable, and they appear to coincide with my definition of that word.

I appreciate this opportunity to express my views on this important subject. Let us all join together in doing everything we can to "Follow Through on Conference Actions."

DISCUSSION OF FOREGOING PAPER

MR. SEARLES: I have read statements printed by most of the national distributors of meats in which they state that they are selling by gross weight. If every jurisdiction across the nation would say that meat shall not be sold by gross weight and stick to it, and if they would insist that there be no short weight, meat distributors would listen to us and we could get somewhere on this problem. We must do it together: and only together can we be successful.

PROMINENCE AND CONSPICUOUSNESS OF QUANTITY STATEMENTS ON PACKAGE LABELS

By L. M. BEACHAM, *Food and Drug Administration*

It is a great pleasure for me to be able to meet with this group of weights and measures officials, to participate in your discussions, and to become better acquainted with you personally. I feel this pleasure both officially, as a member of the Food and Drug Administration, and personally. Officially, I am keenly aware of the invaluable assistance that you often give to us by using your police power to help us deal directly with problems with which the routine of Federal procedure is perhaps too cumbersome and time-consuming to cope efficiently and effectively in the particular circumstance, and by taking care of many matters under your State laws and local ordinances that otherwise would become our duty and responsibility to deal with. This takes a considerable burden off of our resources, which we can then use in those areas of law enforcement that can best be served by the Federal authority. My personal pleasure in meeting with you stems, in part, from the fact that for a number of years my father was a weights and measures official for the State of South Carolina; hence, I am well acquainted with many of the problems with which you deal and with the zeal and enthusiasm that you devote to your work.

As many of you may recall, Dr. Milstead of the Food and Drug Administration spoke before the 41st National Conference in 1956, on the "Legibility of Quantity of Contents Declarations," and covered the requirements of the Federal Act quite comprehensively. Since neither the law nor the regulations relating to net contents have been changed since that time, all that I say on the subject must perforce be repetition of what Dr. Milstead has quite competently discussed. It is at the risk of repeating, therefore, what many of

you know quite well that I undertake to discuss the requirements of the Federal Act for prominence and conspicuousness in quantity of contents declarations.

The Food, Drug, and Cosmetics Act requires a number of informative statements to appear on food labels in addition to the net contents statement. Among these are the name of the food, the name of the manufacturer or distributor, the presence of any artificial coloring, artificial flavoring, or chemical preservatives, and if the food is a fabricated food for which no standard of identity has been established, the common or usual name of each ingredient. In dealing with the manner in which this information shall appear on the label, section 403 (f) of the Act reads:

[A food shall be deemed to be misbranded] If any word, statement, or other information required by or under authority of this Act to appear on the label or labeling is not prominently placed thereon with such conspicuousness (as compared with other words, statements, designs, or devices, in the labeling) and in such terms as to render it likely to be read and understood by the ordinary individual under customary conditions of purchase and use.

For the purpose of our present discussion we are interested only in how this provision of the Act relates to the quantity of contents statement. I wish there were a formula by which we could determine whether such a statement appears with the prominence and conspicuousness that those who framed the law had in mind, but there is not. And so far as the records of the legislative history of the law show, there was little or no discussion of this provision in the committee hearings. Apparently the members of Congress felt that they had expressed their intentions in a manner that could be easily understood and readily complied with. And, indeed, I think this is the case where the one who designs the label is genuinely interested in setting forth the required information where it can be readily seen and understood. By far the majority of food packers' labels are in this category. It is only when the designer of a label is less interested in displaying the required information than in giving prominence to other written, graphic, or pictorial matter which he feels will better promote the sale of his product that we are sometimes faced with the problem of deciding whether or not the quantity of contents statement, and perhaps other required information, appear with the degree of conspicuousness contemplated by the law.

In the years immediately following the passage of the new Federal law in 1938 practically all food labels were brought into substantial compliance with its requirements and thousands of labels were submitted to us for informal comment. But in recent years we have observed that a serious degree of backsliding has taken place. This regrettable situation can be attributed to at least two factors. The first has been the growing importance of the supermarket as the chief sales outlet of packaged foods. There the label, rather than the clerk, must sell the merchandise. Hence, the label that can shout its message most loudly, that can catch the consumer's eye, and that can induce her hand to shift the product from the shelf to her basket, is the winner in the competition for the much-coveted shelf space. Colorful vignettes, glamour words, sensational statements, and other sales and promotional material have tended to crowd into obscure corners of the label and to reduce the type size of statements giving information, including the quantity of contents, that the consumer is entitled to. In a chart recently prepared by a nationally known

firm of label and package designers, the very last item in ten broad categories, each of which listed several features to be considered in judging a label, was this statement: "Is required legal copy such as pure food and drug statements handled in a manner that meets requirements without detracting from package appearance?"

The other factor that has contributed to the recent appearance of less prominent net weight statements has been the reduced amount of activity that we have been able to give this particular phase of law enforcement. With constantly mounting costs and restricted appropriations we found such a large part of our resources required to deal with matters involving danger to health and with decomposition and filth, that for several years we were able to devote very little attention to problems of an economic nature, such as improper labeling. We believe we are now in a position to give somewhat more attention to violations of this type, and it is our intention to bring about improvements in compliance with labeling requirements. In doing this we will continue to be guided by the language of our Regulation 1.9, which points out the conditions under which quantity of contents declarations and other required statements may lack that prominence and conspicuousness that is required by the law. These conditions may be summarized under the following six headings:

(1) Failure to appear on the particular part of the label that is displayed under customary conditions of the sale. We believe that the label is most likely to comply, if the required statements appear on the principal display panel or panels, but we acknowledge that it is possible for them to appear elsewhere on the label and still to be in compliance, depending on the circumstances.

(2) Failure to appear on all display panels when there are more than one. We believe that compliance is most nearly assured if the net contents statement appears on each panel.

(3) Failure of the package to bear a label of sufficient size to display the net contents statement prominently. This can be obviated in many cases simply by using a larger label.

(4) Using label space for words or designs not required by the law. The net contents statement is required and should not be subordinated to other information that is not required.

(5) Using label space to give undue conspicuousness to other information, designs, or devices. We do not object to pictures or designs on labels, but a prominent space must be left for the net contents statement and other information required by the law.

(6) Using small type, insufficiently contrasting background, other printed matter or designs, or vignettes that crowd or obscure the net contents statement. Prominently displaying brand names, trademark designs, or other features is consistent with good packaging design to the extent that it does not interfere with the right and the ability of the consumer readily to see and read under the conditions of purchase label information that he is entitled by law to have.

These are the guiding principles by which we evaluate prominence and conspicuousness of net contents statements on labels. They are based on the fundamental concept that people have a right to know how much they are buying when they purchase a package food, and they should not be required to search the label for this information. While we have applied these principles innumerable times in commenting on specific labels that have been referred to us for informal review by manufacturers, distributors, and packers who wish to use them, or as a result of citation action brought under section 305 of our Act, there have been very few interpretative court decisions that are directly applicable. While these few decisions support the fundamental philosophy of the law that whatever is required to appear on the label must appear in such a manner that it can be

easily read and understood by the ordinary consumer, we must bear in mind that it is a question of fact in each case as to whether or not the law is satisfied. No hard and fast rule can be laid down, such as specifying a minimum type size. For example, a net contents statement that would be inconspicuous on a No. 10 can, might be completely adequate on a 2-ounce bottle of flavoring extract. Printing that is plain on paper may be well-nigh invisible on cellophane. When we are in doubt about a particular label we sometimes try it out on a number of disinterested individuals to obtain their reaction to it. A general agreement either for or against the conspicuousness of the wording is very helpful to us in arriving at an estimate as to what consumers in general would think about it and presumably what the decision of a jury might be if it went before them. To ascertain the reaction of the public to certain representations we have also made limited use of evidence obtained by public opinion research or public opinion surveys in other types of court actions where it has been necessary. But we have not used this technique to support action on violations involving conspicuousness of label statements. For the results of such surveys to be admissible in court, the work must be done by experts who are qualified by training and experience to conduct such surveys. They must be carefully planned and carried out, and are expensive to conduct. This limits their use in any but the most important cases.

And now in closing, I would like to remind you that we are always glad to discuss special problems or labels, and we invite you to write to us at any time about any question on which you would like our views. If you come across labels bearing net contents statements that you think are improper, feel free to take them up with our nearest District headquarters or with us. We will gladly give you our opinion.

We are proud of our close working relationship with weights and measures officials throughout the United States, and we are anxious to assist in every way we can to bring about full compliance with the spirit and letter of the law. We feel that you are doing a splendid job and one of particular significance and importance to the public in these days of high living costs. The American people and the legitimate industry are indebted to you for protecting them and their pocketbook.

QUALIFYING TERMS USED WITH QUANTITY STATEMENTS

By S. H. CHRISTIE, JR., *Deputy State Superintendent, Division of Weights and Measures, Department of Law and Public Safety, State of New Jersey*

When it was suggested by your Conference Secretary that an open forum discussion be held on the matter of administration problems, I felt that an opportunity had presented itself to bring before the delegates for their consideration and discussion the very important problem pertaining to the use of qualifying terms used with quantity statements.

The attempt on the part of industrial representatives to qualify the quantity statements on packaged items has in many cases been successfully handled and has contributed materially to bringing about a greater accuracy in the description of the quantitative net contents of an item in package form. On the other hand, either deliberately or through indifference or plain ignorance, there are cer-

tain firms and individuals that appear to insist upon the use of such qualifying terms which have a tendency to make a mockery of standards as presently established and used.

In connection with regulation requirements and the continuing recession of the packaging of commodities at the retail level and increase at the manufacturer or packer level, there is no doubt as to the necessity and the increasing need for use of the proper qualifying terms in order to establish accuracy of description without doubt as to the net quantity of the commodity contained. Some of the more common terms requiring qualification are those where two or more systems of weight or measure use certain terms which are common to all. This may be well illustrated by use of the following examples: "liquid quarts," "dry quarts," "liquid pints," "dry pints," "avoirdupois ounces," "liquid ounces," and "troy ounces." It will be very readily observed that most of the packages which are involved in the sale of commodities at the retail level fall into this category and unless the distinction is properly made, the purchaser is lacking accurate information and may be subject to certain losses, and at the same time, unfair competition is established among the manufacturer, packer, distributor, and retailer.

Ordinarily there is encountered very little difficulty from the standpoint of administration in obtaining a really quick correction when the lack of such proper qualifying terms have been found. The difficulties in these instances generally appear to be attributed to the acquisition of familiarity with the terms employed by a segment of industry over a period of time without thought being given to the fact that the same descriptive terms may be used for another purpose, or they might be brought about by those who have been engaged to do a particular type of specialized merchandising operation. These conditions generally seem to appear whenever new labeling has been processed, and, under the guise of attraction and eye appeal, there results either the entire deletion of the important descriptive adjectives necessary for accurate information or their relegation to almost perfect oblivion by relocation of their position on the labels—with a resulting lack of conspicuousness. When such inconspicuousness has prevailed for a period of time and complaints have not been registered, the condition is usually followed by abbreviations of quantitative net content markings. It seems to be a general opinion that this is the most desirable item to eliminate, if at all possible, using the excuse that higher initial costs of labels are caused by the additional printing required which must be passed on to the purchaser. This argument is in most instances, fallacious.

Then too, we have those who attempt to avoid their responsibilities to the consumer in furnishing him with full weight or measure at the time of purchase by hiding behind the use of such qualifying terms as "net weight when packed," "approximate weight," or the qualifying word "approximately" in connection with the statement of quantity of weight or measure involved. The use of such terms constitutes a major problem to those engaged in administrative work relating to weights and measures. There are several reasons for this, the most important ones being, first, the larger percentage of such cases usually involve short weight or measure and, second, such use seems to "snowball," especially if a competitive item has made an

appearance in public for a period of time without having been detected by weights and measures officials.

It is a well known fact, and one that is generally well accepted by the public, that there are people engaged in the advertising field who are very prolific users of superlative adjectives primarily for the purpose of attracting the attention of those with whom their material comes into sight or contact. This use has become so extensive in some fields of endeavor, such as the movie industry for instance, that, as a result of competitions, it has been found necessary to use adjective upon adjective plus additional prefixes to accomplish the desired end result. Such terms as "colossal," "super-colossal," etc., have a tendency in the final analysis to result in the loss of the initial descriptive value of an adjective. Activities of this nature are now beginning to appear in the advertising and on the label of packaged commodities, with the result that weights and measures officials are being presented with still another problem.

The members of this Conference may well recall the sessions of the 40th National Conference on Weights and Measures, held here in the City of Washington under the sponsorship of the National Bureau of Standards during the year 1955, when this matter was drawn to the attention of the body assembled by the Acting Chairman of the Committee on Methods of Sales of Commodities during his report, together with his recommendations, which were subsequently adopted by the Conference. Item number three of this report dealt with the use of extraordinary terms then making an appearance in connection with quantitative statements on standard containers of ice cream. The extraordinary terms referred to, used in describing the quantitative statements of this product, included such as "jumbo," "giant," "king size," and "Texas pint." It was also pointed out then that in merchandising articles of food products such as cake and candy, advertisements were appearing on the scene using the qualifying term "full" in connection with the weight statement "pound."

Such descriptive wording in connection with expressions of standards of weight or measure cannot be condoned, because by continued use and association a psychological effect is created whereby the value of a standard is questioned. Thus, when used of itself, the standard term would no longer be indicative of its true value. This condition is substantiated by authorities compiling unabridged dictionaries as they define the word "full" to mean "complete measure," and the word "jumbo" to be "a colossus." This would indicate that only the merchandiser so branding his article would be giving full measure or more and all others failing to so mark would be short. As weights and measure officials it is obvious to you that it is impossible to have a standard measure or weight contain more than its rated capacity except within certain limitations or tolerances which are prescribed by our codes, if its value is to be clearly understood.

I, therefore, feel that the time has come when the subject of qualifying terms used in connection with a designation of weight or measure must be given serious consideration by this Conference, and certain terminology be considered as being indicative of proper marking, and the use of others be prevented in an effort to establish accurate statements of contents on the labels of commodities in package form.

MR. GREENE: Mr. Christie, do you accept the imperial quart as a unit of measure?

MR. CHRISTIE: Yes, in international trade. As to products of the United States, although the problem has not yet come up, I think that we must adhere to U. S. standard units.

MR. BEACHAM: If a product moves interstate, it must be labeled in terms of U. S. units. The imperial quart is not recognized under the Federal Food and Drug Act.

REPORT OF THE AUDITING COMMITTEE, PRESENTED BY J. E. MAHONEY, CHAIRMAN

As of June 10 the Auditing Committee examined the financial records of the Conference and found the same to be in order, and correct in every detail.

(Signed) J. E. MAHONEY, *Chairman*,
LEONARD DERIENZO
H. A. LASON

Committee on Auditing.

(The report of the Auditing Committee was adopted by the Conference.)

REPORT OF THE TREASURER

JUNE 1, 1958

Balance on hand June 1, 1957----- \$2, 297. 58

RECEIPTS:

June 7—

Registration fees—1957 Conference, 371 at
\$5.00----- \$1, 855. 00

Interest accrued----- 26. 41

1, 881. 41

Total-----

4, 178. 99

DISBURSEMENTS:

June 4-7, 1957—

Expenses of 42d National Conference----- \$1, 407. 78

November 12, 1957—

Flowers----- 9. 36

January 15, 1958—

Honor Award Certificates----- 6. 40

May 31, 1958—

Receipt book and rubber stamp----- 9. 45

Bank charges----- 1. 80

1, 434. 79

Balance on hand June 1, 1958----- \$2, 744. 20

(Signed) C. C. MORGAN,
Treasurer.

(The report of the Treasurer was accepted by the Conference.)

PERSONS ATTENDING THE CONFERENCE **Active Members—State, City, and County Officials**

CALIFORNIA

State.....	J. E. BRENTON, Chief, Bureau of Weights and Measures, Department of Agriculture, 1220 "N" Street, Sacramento.
County:	
Alameda.....	W. A. KERLIN, County Sealer of Weights and Measures, 333 Fifth Street, Oakland.
Kern.....	A. D. ROSE, County Sealer of Weights and Measures, 1116 E. California Avenue, Bakersfield.
Los Angeles.....	C. M. FULLER, County Sealer of Weights and Measures, 3200 N. Main Street, Los Angeles.
San Diego.....	H. J. McDADE, County Sealer of Weights and Measures, 1480 F Street, San Diego.

COLORADO

State.....	H. N. DUFF, Supervisor, Weights and Measures Section, Department of Agriculture, 3130 Zuni Street, Denver. H. H. HUSTON, Director, Oil Inspection Department, 1024 Speer Boulevard, Denver.
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CONNECTICUT

State.....	A. R. FRASSINELLI, Commissioner, Food and Drug Commission, State Office Building, Hartford. F. M. GREENE, Chief, Division of Weights and Measures.
County:	
Fairfield.....	W. E. SHEEHY, JR., County Sealer of Weights and Measures, County Court Building, Bridgeport.
Hartford.....	R. J. MARCOTTE, County Sealer of Weights and Measures, County Court Building, 95 Washington Street, Hartford. V. J. ARGENTO, Deputy County Sealer. H. J. ROJESKI, Deputy County Sealer.
Tolland.....	W. F. MASINDA, County Sealer of Weights and Measures, West Willington.
City:	
Hartford.....	NATHAN KALECHMAN, City Sealer of Weights and Measures, 550 Main Street.
Middletown.....	PETER GRASSI, City Sealer of Weights and Measures, Post Office Box 223.
New Britain.....	A. J. ALBANESE, City Sealer of Weights and Measures, Municipal Building.

DISTRICT OF COLUMBIA

Weights, Measures, and Markets, Department of Licenses and Inspection, Room 131 District Building,	Fourteenth and E Streets, N. W., Washington, D. C.
District.....	J. T. KENNEDY, Chief. J. M. BOUCHER, Supervisor. J. T. BENNICK, Inspector and Investigator. W. R. CORNELIUS, Inspector and Investigator. DAVID FORBES, Inspector and Investigator. F. C. HARBOUR, Inspector and Investigator. KENNETH HAYDEN, Inspector and Investigator. H. P. HUTCHINSON, Inspector and Investigator. W. H. JENNINGS, Inspector and Investigator. G. P. KOSMOS, Inspector and Investigator. T. B. MIDDLETON, Inspector and Investigator. I. L. WAGNER, JR., Inspector and Investigator. F. M. WARNER, Inspector and Investigator. W. W. WELLS, Inspector and Investigator

FLORIDA

State----- NALLS BERRYMAN, Director, Weights and Measures
Division, Department of Agriculture, Nathan Mayo
Building, Tallahassee.

City:
Jacksonville----- H. E. CRAWFORD, Inspector of Weights and Measures,
431 West Eighth Street.

Miami----- H. E. HOWARD, Supervisor, Division of Trade Stand-
ards, Coconut Grove Station, Post Office Box 708.

GEORGIA

State----- P. I. MORRIS, JR., Director, Weights and Measures
Division, Department of Agriculture, Room 320
Agriculture Building, Atlanta.

J. W. D. HARVEY, State Oil Chemist, State Oil Labora-
tory, Department of Revenue, 264 Capitol Place,
Atlanta.

HAWAII

City: Honolulu----- B. K. CUMMINS, Chief Inspector, Weights and Measures
Division, Office of the Sheriff, Honolulu.

ILLINOIS

State----- M. M. EMERICK, Assistant Superintendent, Division of
Foods, Dairies, and Standards, Emmerson Building,
State Fairgrounds, Springfield.

City: Chicago----- I. M. LEVY, City Sealer of Weights and Measures,
Room 302 Central Office Building, 320 North Clark
Street.

R. J. FAHY, Chief Deputy Sealer.

INDIANA

State----- R. E. MEEK, Director, Division of Weights and Meas-
ures, State Board of Health, 1330 West Michigan
Street, Indianapolis.

W. C. BOYD, State Inspector.

County:
Grant----- R. C. PARKS, County Inspector of Weights and Meas-
ures, 2429 West Eighth Street, Marion.

LaPorte----- J. F. GITTINGS, County Inspector of Weights and Meas-
ures, Room 14A Court House, LaPorte.

St. Joseph----- S. C. GRZESKOWIAK, County Inspector of Weights and
Measures, Room 14 Court House, South Bend.

Vigo----- R. J. SILCOCK, County Inspector of Weights and Meas-
ures, Room 5 Court House, Terre Haute.

City:
Anderson----- HOBART MCDANIEL, City Inspector of Weights and
Measures, Room 6 Court House.

Gary----- C. C. MORGAN, City Sealer of Weights and Measures,
Room 204 City Hall.

Indianapolis----- C. R. SCHEPER, Supervising Inspector of Weights and
Measures, Room 2 City Hall.

South Bend----- B. S. CICHOWICZ, City Inspector of Weights and Meas-
ures, City Hall, 214 North Main Street.

Terre Haute----- J. T. HARPER, City Inspector of Weights and Measures,
Room 205 City Hall.

IOWA

State----- J. W. REESE, Supervisor, Weights and Measures Divi-
sion, Department of Agriculture, Capitol Building,
Des Moines.

L. J. DAMRON, State Inspector.

KANSAS

State----- J. F. TRUE, State Sealer, Weights and Measures Divi-
sion, State Board of Agriculture, State Office Build-
ing, Topeka.

J. L. O'NEILL, State Inspector of Weights and Measures, Williamsburg.
 City: Kansas City----- J. O. SLAUGHTER, JR., License Inspector, Department of Finance and Revenue, City Hall.
 D. L. LYNCH, Deputy City Sealer of Weights and Measures.

KENTUCKY

State----- B. J. BUTLER, Commissioner, State Department of Agriculture, State Office Building, Frankfort.
 G. L. JOHNSON, Director, Division of Weights and Measures.

LOUISIANA

State----- F. F. THOMPSON, Chief Chemist, Petroleum Products Tax Division, Department of Revenue, Post Office Box 8374, University Station, Baton Rouge.

MAINE

State----- H. D. ROBINSON, Deputy State Sealer of Weights and Measures, Department of Agriculture, State House, Augusta.
 City: Portland----- C. J. WILLS, Jr., City Sealer of Weights and Measures, City Building.

MARYLAND

State----- P. E. NYSTROM, Director of Extension Service, State Board of Agriculture, University of Maryland, College Park.
 J. E. MAHONEY, Superintendent of Weights and Measures, Department of Markets.
 R. N. SMITH, Assistant Superintendent.
 R. W. GLENDENNING, State Inspector.
 J. D. MAHER, State Inspector, Midland.
 H. H. HUNTER, Chief Engineer, Public Service Commission of Maryland and President of Conference of Utility Commission Engineers, Munsey Building, Baltimore.
 County: Montgomery-- E. W. BUCKLIN, Director, Department of Inspection and Licenses, County Office Building, Rockville.
 L. B. MORTON, County Inspector of Weights and Measures.
 S. W. PARRISH, Chief, Division of Zoning, Permits and Licenses.
 City: Baltimore----- G. H. LEITHAUSER, Chief Inspector, Division of Weights and Measures, Department of Public Works, 1106 Municipal Building.

MASSACHUSETTS

State----- J. P. McBRIDE, Director of Standards and Necessaries of Life, Department of Labor and Industries, 194 State House, Boston.
 W. C. HUGHES, State Inspector of Weights and Measures.
 City:
 Boston----- J. F. MCCARTHY, City Sealer of Weights and Measures, Room 105 City Hall Annex.
 Brockton----- J. F. COYNE, City Sealer of Weights and Measures, City Hall.
 Cambridge----- A. T. ANDERSON, City Sealer of Weights and Measures, Municipal Building.
 Everett----- L. L. ELLIOTT, City Sealer of Weights and Measures, City Hall.
 Malden----- J. J. KELLEY, City Sealer of Weights and Measures, Police Station.
 Newton----- J. E. BOWEN, City Sealer of Weights and Measures, City Hall.

Quincy----- H. H. HUGHES, City Sealer of Weights and Measures,
City Hall Annex, 63 Saville Row.
West Springfield--- C. A. JACOBSON, City Sealer of Weights and Measures,
Town Hall.

MICHIGAN

State----- C. O. COTTOM, Supervising Inspector of Weights and
Measures, Division of Foods and Standards, State
Department of Agriculture, Lewis Cass Building,
Lansing.
L. K. RICE, State Inspector, Post Office Box 43, St.
Johns, Michigan.
MARGARET TREANOR, Secretary, Division of Foods and
Standards, State Department of Agriculture, Lewis
Cass Building, Lansing, and Secretary, Michigan As-
sociation of Weights and Measures Officials.
City:
Dearborn----- J. A. HUGHES, Superintendent, Department of Licenses,
Weights, and Measures, 13030 Hemlock Avenue.
Detroit----- J. H. HITCHINGS, Inspector, Bureau of Weights and
Measures, 740 Elmwood Avenue.
Grand Rapids----- L. W. STOLL, City Sealer of Weights and Measures, 301
Market Street, S. W.
Highland Park----- J. F. BAKER, City Sealer of Weights and Measures, Po-
lice Department.
Lansing----- W. M. SAXTON, City Sealer of Weights and Measures,
333 North Cedar Street.
Pontiac----- W. A. BAERWOLF, City Sealer of Weights and Measures,
Public Safety Building, 110 East Pike Street.

MINNESOTA

State----- ERLING HANSEN, Supervisor, Department of Weights
and Measures, Railroad and Warehouse Commission,
One Flour Exchange, Minneapolis.
J. S. BEATTY, State Inspector.
G. A. FAZENDIN, State Inspector.
City: Minneapolis----- FRANK WOLINSKI, Alderman, City Council.
J. G. Gustafson, Chief Inspector, Department of Li-
censes, Weights and Measures, Room 101A Court
House.

MISSISSIPPI

State----- W. G. SELLERS, State Sealer of Weights and Measures,
Route 1, Laurel.

MISSOURI

State----- G. W. BAY, Chief Inspector, Weights and Measures
Division, Department of Agriculture, Jefferson City.
City: St. Louis----- J. A. BERNARD, Commissioner of Weights and Measures,
Room 12 City Hall.

MONTANA

State----- DELBERT WALRATH, Chief Sealer, Division of Weights
and Measures, Department of Agriculture, Capitol
Building, Helena.

NEVADA

State----- E. L. RANDALL, State Sealer, Department of Weights
and Measures, Post Office Box 719, Reno.

NEW HAMPSHIRE

State----- C. A. LYON, Director, Bureau of Weights and Measures,
Division of Markets and Standards, Department of
Agriculture, State Office Building, Concord.
A. H. Dittrich, Chief Inspector.

City:

Keene-----	R. M. SEAVER, City Sealer of Weights and Measures, 3 Washington Street.
Portsmouth-----	W. A. THOMSON, City Sealer of Weights and Measures, 56 Ridges Court.

NEW JERSEY

State-----	ALFRED D'AURIA, Deputy Attorney General, Department of Law and Public Safety, 187 West Hanover Street, Trenton.
	S. H. CHRISTIE, Jr., Deputy State Superintendent, Division of Weights and Measures.
	R. K. BODENWEISER, Assistant Superintendent.
	A. T. SMITH, Assistant Superintendent.
	J. R. BIRD, Senior Inspector.

County:

Atlantic-----	J. E. MYERS, County Superintendent of Weights and Measures, 350 South Egg Harbor Road, Hammonton.
Bergen-----	M. J. SANTIMAURO, County Superintendent of Weights and Measures, 66 Zabriskie Street, Hackensack.
	E. E. DAWSON, Assistant Superintendent.
Burlington-----	P. F. NUNN, County Superintendent of Weights and Measures, 236 Hooker Street, Riverside.
	D. F. HUMMEL, Assistant Superintendent.
Camden-----	A. C. BECKER, County Superintendent of Weights and Measures, City Hall, Camden.
Cumberland-----	ALFRED LIRIO, County Superintendent of Weights and Measures, Post Office Box 369, Vineland.
	R. P. GARDELLA, Assistant Superintendent, 589 North Valley Avenue, Vineland.
Essex-----	W. H. SCHNEIDEWIND, County Superintendent of Weights and Measures, 278 New Street, Newark.
Gloucester-----	M. J. CAULFIELD, County Superintendent of Weights and Measures, Almonesson.
	R. J. MORRIS, Assistant Superintendent of Weights and Measures, Box 377, Woodbury.
Mercer-----	R. M. BODENWEISER, County Superintendent of Weights and Measures, Court House, Trenton.
Monmouth-----	W. I. THOMPSON, County Superintendent of Weights and Measures, Hall of Records, Freehold. (Mailing address, P. O. Box 714, Allenhurst.)
	J. A. J. BOVIE, Assistant Superintendent.
	W. G. DOX, Assistant Superintendent.
Passaic-----	WILLIAM MILLER, County Superintendent of Weights and Measures, Administration Building, Paterson.
Union-----	J. M. DIETZ, County Superintendent of Weights and Measures, Court House, Elizabeth.
Warren-----	G. E. CONNOLLY, County Superintendent of Weights and Measures, Court House, Belvidere.

City:

Camden-----	ALFRED DiPIERO, Municipal Superintendent of Weights and Measures, City Hall.
Englewood-----	LEONARD DERIENZO, Municipal Superintendent of Weights and Measures, City Hall.
Garfield-----	CHARLES BENANTI, Municipal Superintendent of Weights and Measures, Police Building.
Jersey City-----	H. J. MYERS, Municipal Superintendent of Weights and Measures, City Hall.
Linden-----	L. T. REAGAN, Municipal Superintendent of Weights and Measures, Room 206 City Hall.
Passaic-----	PAUL DeVRIES, Municipal Superintendent of Weights and Measures, City Hall.
	JOSEPH SHAW, Assistant Municipal Superintendent.
Paterson-----	J. P. LEONARD, Municipal Superintendent of Weights and Measures, 115 Van Houten Street.
	W. J. KEHOE, Assistant Municipal Superintendent.
Trenton-----	R. J. BONEY, Municipal Superintendent of Weights and Measures, 485 Hamilton Avenue.
Union City-----	A. O. OSLUND, Municipal Superintendent of Weights and Measures, 3715 Palisade Avenue.

NEW YORK

State-----	PERSIA CAMPBELL, Consumer Counsel to the Governor, State Office Building, Albany. J. J. LEONARD, Director, Bureau of Weights and Measures, Department of Agriculture and Markets, State Office Building.
County:	
Genesee-----	G. A. PULLMAN, County Sealer of Weights and Measures, 19 Buffalo Street, Bergen.
Monroe-----	E. D. HUBBLE, County Sealer of Weights and Measures, 1400 South Avenue, Rochester.
Nassau-----	ROBERT WILLIAMS, County Sealer of Weights and Measures, Old County Court House Annex, Mineola.
Niagara-----	H. C. HULSHOFF, County Sealer of Weights and Meas- ures, 17 High Street, Lockport.
Wayne-----	H. H. WRIGHT, County Sealer of Weights and Measures, 30 Catherine Street, Lyons.
City:	
Binghamton-----	H. A. LASON, City Sealer of Weights and Measures, 60 Robinson Street.
Elmira-----	J. F. MADDEN, City Sealer of Weights and Measures, City Hall.
Ithaca-----	E. P. NEDROW, City Sealer of Weights and Measures, 318 Columbia Street.
Lackawanna-----	J. J. SERES, City Sealer of Weights and Measures, 84 Rosary Avenue.
Rochester-----	A. C. SAMENFINK, City Sealer of Weights and Measures, Rochester Food Terminal, Administration Building.
Yonkers-----	JOHN DIMASE, City Sealer of Weights and Measures, City Hall.

NORTH CAROLINA

State-----	C. D. BAUCOM, Superintendent, Weights and Measures Division, Department of Agriculture, Agriculture Building, Raleigh. J. I. MOORE, Field Supervisor.
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NORTH DAKOTA

State-----	J. C. GOLL, Chief Inspector, Weights and Measures Department, Public Service Commission, Capitol Building, Bismarck. M. A. HAALAND, State Inspector.
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OHIO

State-----	V. D. CAMPBELL, Chief, Division of Weights and Measures, Department of Agriculture, Reynoldsburg.
County:	
Licking-----	G. F. PRICE, Deputy County Sealer of Weights and Measures, c/o County Auditor, Newark.
Medina-----	R. W. SEARLES, Deputy County Sealer of Weights and Measures, County Board of Education Building, Medina.
Ottawa-----	RUDOLPH STARKLOFF, Deputy County Sealer of Weights and Measures, Post Office Box 208, Port Clinton.
City:	
Akron-----	R. K. SLOUGH, City Sealer of Weights and Measures, City Hall.*
Cincinnati-----	W. E. G. RHEIN, Superintendent, Markets, Weights, and Measures, Department of Safety, Sixth Street Market House.
Lorain-----	GABOR TOTH, City Sealer of Weights and Measures, 3019 Caroline Avenue.
Springfield-----	WALTER HALL, City Sealer of Weights and Measures, City Hall.
Youngstown-----	F. B. JONES, City Sealer of Weights and Measures, 944 Wenona Drive.

*Registered in absentia.

OREGON

State----- W. B. STEELE, Deputy State Sealer of Weights and Measures, State Department of Agriculture, Agriculture Building, Salem.

PENNSYLVANIA

State----- H. M. TURRELL, Director, Bureau of Standard Weights and Measures, Department of Internal Affairs, Capitol Building, Harrisburg.

County:

Bucks----- W. A. HILSBOS, County Sealer of Weights and Measures, 4418 Bristol Road, Oakford.

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City: Erie----- P. F. WATSON, City Sealer of Weights and Measures, City Hall.

PUERTO RICO

Commonwealth----- A. E. DIAZ, Head, Division of Weights and Measures, Economic Stabilization Administration, Post Office Box 4183, San Juan.

RHODE ISLAND

State----- E. R. FISHER, State Sealer of Weights and Measures, Department of Labor, Veterans Memorial Building, 83 Park Street, Providence.

City:

East Providence--- R. G. CLARKE, City Sealer of Weights and Measures, 18 Miller Avenue, Rumford.

Providence----- E. F. MORAN, Superintendent of Weights and Measures, 141 Fountain Street.

SOUTH CAROLINA

State----- C. H. STENDER, Assistant to Commissioner, Department of Agriculture, Wade Hampton Office Building, Post Office Box 1080, Columbia.
RALPH MAGOFFIN, Director, Bureau of Inspection.

SOUTH DAKOTA

State----- J. A. ETZKORN, Heavy Scale Inspector, Public Utilities Commission, Pierre.
D. C. HANNA, Heavy Scale Inspector, Spencer.
C. H. MCKEE, Heavy Scale Inspector, Pierre.

TENNESSEE

City:

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Memphis----- V. D. ROGERS, City Inspector of Weights and Measures, 590 Washington Avenue.

Nashville----- TOM WEBB, City Sealer of Weights and Measures, 300 Demonbreun Street.

TEXAS

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Houston----- R. L. SHARP, Inspector.

F. S. BONNER, SR., Deputy Sealer, Weights and Measures Division, Department of Public Works, City Hall.

UTAH

City: Salt Lake City-- E. C. WESTWOOD, City Sealer of Weights and Measures, 118 East First Street, South.

VERMONT

State----- A. L. LAPLANT, Director, Division of Weights and Measures, Department of Agriculture, Agriculture Building, Montpelier.

VIRGINIA

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Alexandria----- C. B. TATE, City Sealer of Weights and Measures, 405 Cameron Street.
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 Norfolk----- W. F. BRADLEY, City Sealer of Weights and Measures, Bureau of Weights and Measures, Department of Public Safety, 148 Bank Street.
 Petersburg----- C. R. BRANCH, City Sealer of Weights and Measures, Room 205 City Hall.
 Richmond----- J. G. WILLIAMS, Jr., Chief, Bureau of Weights and Measures, The Mosque Building, Room 121, Laurel and Main Streets.
 Roanoke----- J. M. HUDGINS, Inspector of Weights and Measures, City Market Building.

WASHINGTON

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State----- H. R. KENNEL, Commissioner, Bureau of Weights and Measures, Department of Labor, 643 State Office Building, 1800 East Washington Street, Charleston.
 County: Harrison----- MRS. BEATRICE LANHAM, County Sealer of Weights and Measures, Bristol.

WISCONSIN

State----- C. L. JACKSON, Chief, Division of Economic Practices, Department of Agriculture, State Capitol, Madison.
 N. E. KIRSCHBAUM, Supervisor, Weights and Measures.
 City:
 Green Bay----- N. P. TILLEMAN, City Sealer of Weights and Measures, City Hall.
 Kenosha----- J. P. KUCHERA, City Sealer of Weights and Measures, City Hall.
 Milwaukee----- L. E. WITT, City Sealer of Weights and Measures, 1331 North Fifth Street.*
 Racine----- R. J. ZIERTEN, City Sealer of Weights and Measures, City Hall.
 West Allis----- J. J. PERSAK, Assistant City Sealer of Weights and Measures, City Hall.

*Registered in absentia.

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R. F. ACKERMANN, Physicist, Length Section.

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MILTON JOHNSON, Marketing Specialist, Regulatory Branch, Fruit and Vegetable Division, Agricultural Marketing Service, Washington, D. C.

J. R. SCOTT, Chief, Trade Label Section, Meat Inspection Division, Agricultural Research Service, Washington, D. C.

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L. M. BEACHAM, Assistant Director, Food Division, Bureau of Biological and Physical Sciences, Food and Drug Administration, Washington, D. C.

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Chatillon, John, & Sons: G. C. REILEY, Vice President, 89 Cliff Street, New York, N. Y.

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Dairy Equipment Company: K. S. HART, Vice President, 1444 East Washington Avenue, Madison, Wis.

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W. J. SCHIESER, Vice President, Product Development.

J. F. SULLIVAN, Chief Engineer, 944 West Fifth Avenue, Columbus, Ohio.

Factory Equipment Company:

J. F. FEIND, President, 190 State Street, Bloomfield, N. J.

M. E. SKIBIAK, Sales.

Fairbanks, Morse and Company:

C. G. GEHRINGER, Manager, Scale Division, 600 South Michigan Avenue, Chicago, Ill.

J. C. KENNEY, Field Engineer, 731 Charing Cross Road, Baltimore, Md.

W. J. RUZEK, Field Engineer, 1803 Vista Lane, Timonium, Md.

Fisher Governor Company: W. H. HOAGLAND, Eastern Manager, Special Controls Division, 375 East State Street, Westport, Conn.

Fuller, H. J. Company:

H. J. FULLER, President, 1371 West Third Avenue, Columbus, Ohio.

W. S. FULLER, Sales Manager.

J. E. FULLER, Service Manager.

Gilbert & Barker Manufacturing Company: WILLIAM KEAY, Manager, Sales Service, West Springfield, Mass.

Granberg Corporation: W. M. MILLIGAN, Eastern Division Sales Manager, 489 Fifth Avenue, New York, N. Y.

Gurley, W. & L. E.: F. G. WILLIAMS, Washington Representative, 5514 Nevada Avenue, N. W., Washington, D. C.

Hobart Manufacturing Company:

K. C. ALLEN, Director of Scale Operations, 448 Huffman Avenue, Dayton, Ohio.

E. A. REUSSENZEHN, Chief Scale Engineer, Dayton Scale Division.

M. E. BONE.

M. W. CRAIG, Representative, Penn Avenue at Simpson Street, Troy, Ohio.

HODGSON, A. E., Dealer, Distributor of Scales, 7046 Garrett Road, Upper Darby, Pa.

Howe Scale Company:

R. F. STRAW, Vice President, 685 Stewart Ave., S. W., Atlanta 10, Ga.

G. D. WILKINSON, National Service Manager, 2941 Scale Ave., Rutland, Vt.

C. E. ROESSLER, Director of Engineering.

J. P. KOSTER

M. J. KAUFFMAN, District Manager, 1910 West Atlantic Street, Philadelphia, Pa.

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McIntyre, John J., Sons: F. L. MCINTYRE, Owner, 514-16 Knorr Street, Philadelphia, Pa.

Measuregraph Company:

C. H. ANGLE, JR., Eastern Regional Manager, 771 South Woodington Road, Baltimore, Md.

F. L. WALL, Washington Representative, Apartment 202, 6603 Arlington Boulevard, Falls Church, Va.

Micro-Meter, Inc.: W. SHANHOUSE, President, Oak Drive, Syosset, N. Y.

Miller, Byron & Associates:

B. D. MILLER, Owner, 7712 Georgia Avenue, Washington, D. C.

J. G. LEWIS, Associate.

IRA PAULEY, Associate.

Neptune Meter Company:

E. F. WEHMANN, Chief Development Engineer, 22-42 Jackson Avenue, Long Island City, N. Y.

R. W. WETJEN, Sales Manager, 19 West Fiftieth Street, New York, N. Y.

H. A. LENTZ, JR., Representative, 1420-26 South Penn Square, Philadelphia, Pa.

Nicol Scales Company: W. F. NICOL, President, 1315 South Akard Street, Dallas, Texas.

Palmer Torsion Balance Company: DAVID PALMER, General Manager, 1186 Broadway, New York, N. Y.

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Potter Aeronautical Corporation:

M. BAYER, Industrial Sales Manager, Route 22, P. O. Box 532, Union, N. J.

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Sanitary Scale Company:

E. C. KARP, Vice President, Manufacturing & Engineering, 910 East Lincoln Avenue, Belvidere, Ill.

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Sauter, August, of New York, Inc.: K. L. GENSHEIMER, Representative, 866 Willis Avenue, Albertson, Long Island, N. Y.

Seraphin Test Measure Company: T. A. SERAPHIN, General Manager, 1314 North Seventh Street, Philadelphia, Pa.

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H. D. LEISENRING, General Sales Manager, 250 Park Avenue, New York, N. Y.

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H. W. BARNES, Assistant Sales Manager, Computer Division.

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W. O. HOWLAND, Engineer.

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American Meat Institute: DEWEY BOND, Director, Washington Office, 727 National Press Building, Washington, D. C.

American Petroleum Institute: J. E. MOSS, Director, Division of Transportation, 1625 K Street, N. W., Washington, D. C.*

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Cooperative League of U.S.A.:

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Eastern Meat Packers Association:

JOSEPH COHN, Representative (Counsel, Meat Trade Institute), 420 Lexington Avenue, New York, N. Y.

F. H. FIROR, Merkel, Inc., 94-01 Sutphin Boulevard, Jamaica, N. Y.

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Food Fair Stores, Inc.: S. D. SYNES, Transportation Coordinator and Coordinator of Store Operations, 320 South Stiles Street, Linden, N. J.

Gasoline Pump Manufacturers Association: G. T. WRIGHT, Managing Director, 551 Fifth Avenue, New York, N. Y.

General Foods Corporation: C. A. CLARK, Engineering Department, 250 North Street, White Plains, N. Y.

General Mills, Inc.: O. A. OUDAL, Director, Products Control, 9200 Wayzata Blvd., South Minneapolis, Minn.

*Registered in absentia.

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Mayer, Oscar, & Company:
 JOHN BARD, Operations Manager, Madison, Wis.
 A. P. BOWMAN, General Product Controller.

Metric Association, Inc.:
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National Association of Dairy Equipment Mfrs.: JOHN MARSHALL, Executive Vice President, 1012 Fourteenth Street, N. W., Washington, D. C.

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 DANIEL BOLAND, General Counsel, 1500 Rhode Island Avenue, N. W., Washington, D. C.
 LOUIS FISHER, Director, Legislative Division.

National Pickle Packers Association: M. F. MARKEL, General Counsel, Munsey Building, Washington, D. C.

National Tank Truck Carriers: LOUIS REZNEK, Director, Engineering and Safety, 1424 Sixteenth Street, N. W., Washington, D. C.

Oyster Institute of North America: F. M. MILES, Director, Box 178, Norfolk, Va.

Paper Can Association: A. W. HOWE, Assistant Executive Secretary, 1532 Philadelphia National Bank Building, Philadelphia, Pa.

Paper Cup and Container Institute, Inc.: R. W. FOSTER, Assistant to Executive Director, 250 Park Avenue, New York, N. Y.

Pennsylvania Railroad: W. P. BUCHANAN, Supervisor of Scales, Test Department, Altoona, Pa.

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RICHARD, C. L., Consultant, Industrial Weighing, Measuring, Counting, and Data Recording Systems, 147 W. Cadiz Avenue, San Clemente, Calif.

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 S. T. SHAW, Vice President, 401 Southern Building, Washington, D. C.
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 M. W. PICKELL, President, 176 West Adams Street, Chicago, Ill.
 SYLVIA PICKELL, Secretary.

Scale Manufacturers Association, Inc.: ARTHUR SANDERS, Executive Secretary, One Thomas Circle, Washington, D. C.

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L. T. SIMMELINK, Equipment Engineer, Structural Division, Marketing Engineering.

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Southern Propane Company: R. H. WHERRY, General Manager, Post Office Box 277, Jesup, Ga.

Sun Oil Company: A. H. MARSH, Manager, Equipment Research Department, 1600 Walnut Street, Philadelphia, Pa.

Swift and Company :

A. C. O'MEARA, Assistant General Counsel, Chicago, Ill.

E. G. SPIKER, 711 Fourteenth Street, N. W., Washington, D. C.

Texas Company: R. H. TOLSON, Assistant Manager, Sales Department, Construction and Equipment Division, 135 East Forty-second Street, New York, N. Y.

Thread Institute, Inc. :

DAVID SNYDER, Executive Director, 11 West Forty-second Street, New York, N. Y.

J. B. DUFFY, Member, Legislation Committee, Gardiner Hall Junior Thread Company, 48 West Thirty-eighth Street, New York, N. Y.

W. D. SEIDLER, Member, Legislation Committee, Coats & Clark, Inc., 430 Park Avenue, New York, N. Y.

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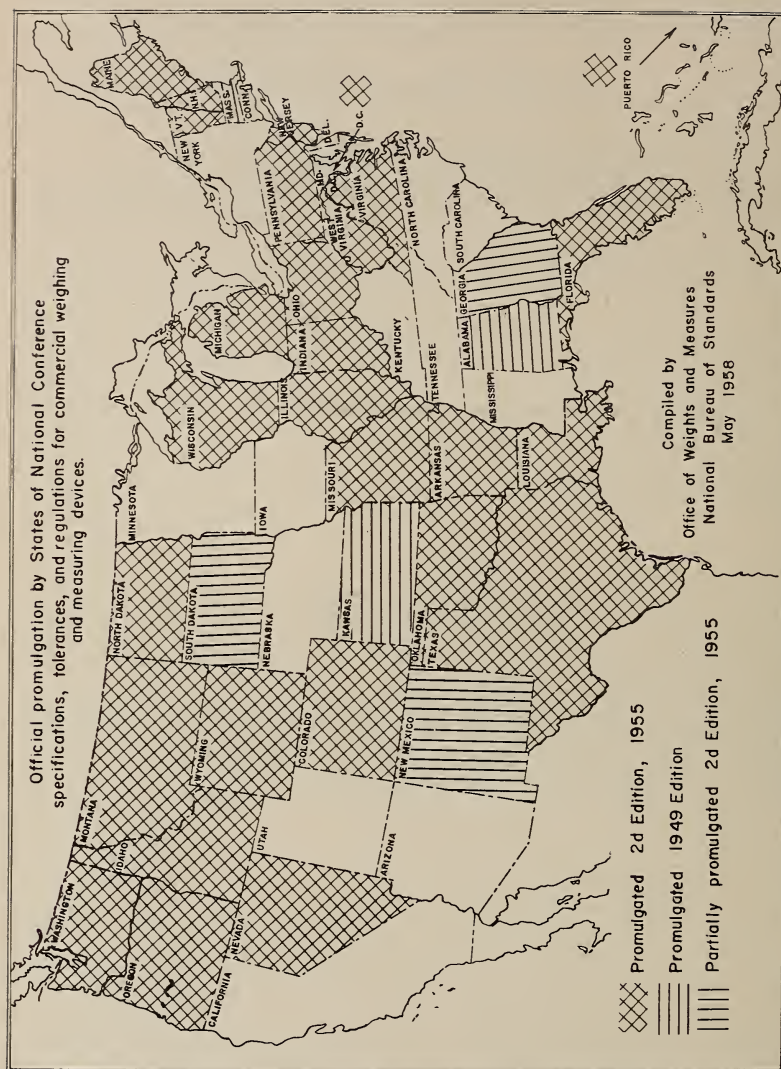


FIGURE 5. Official promulgation by States of National Conference specifications, tolerances, and regulations for commercial weighing and measuring devices as published in *National Bureau of Standards Handbook 44—2d Edition*.

THE NATIONAL BUREAU OF STANDARDS

The scope of activities of the National Bureau of Standards at its headquarters in Washington, D. C., and its major laboratories in Boulder, Colo., is suggested in the following listing of the divisions and sections engaged in technical work. In general, each section carries out specialized research, development, and engineering in the field indicated by its title.

WASHINGTON, D. C.

Electricity and Electronics. Resistance and Reactance. Electron Devices. Electrical Instruments. Magnetic Measurements. Dielectrics. Engineering Electronics. Electronic Instrumentation. Electrochemistry.

Optics and Metrology. Photometry and Colorimetry. Optical Instruments. Photographic Technology. Length. Engineering Metrology.

Heat. Temperature. Physics. Thermodynamics. Cryogenic Physics. Rheology. Engine Fuels. Free Radicals Research.

Atomic and Radiation Physics. Spectroscopy. Radiometry. Mass Spectrometry. Solid State Physics. Electron Physics. Atomic Physics. Neutron Physics. Radiation Theory. Radioactivity. X-rays. High Energy Radiation. Nucleonic Instrumentation. Radiological Equipment.

Chemistry. Organic Coatings. Surface Chemistry. Organic Chemistry. Analytical Chemistry. Inorganic Chemistry. Electrodeposition. Molecular Structure and Properties of Gases. Physical Chemistry. Thermochemistry. Spectrochemistry. Pure Substances.

Mechanics. Sound. Mechanical Instruments. Fluid Mechanics. Engineering Mechanics. Mass and Scale. Capacity, Density, and Fluid Meters. Combustion Controls.

Organic and Fibrous Materials. Rubber. Textiles. Paper. Leather. Testing and Specifications. Polymer Structure. Plastics. Dental Research.

Metallurgy. Thermal Metallurgy. Chemical Metallurgy. Mechanical Metallurgy. Corrosion. Metal Physics.

Mineral Products. Engineering Ceramics. Glass. Refractories. Enameled Metals. Concreting Materials. Constitution and Microstructure.

Building Technology. Structural Engineering. Fire Protection. Air Conditioning, Heating, and Refrigeration. Floor, Roof, and Wall Coverings. Codes and Safety Standards. Heat Transfer.

Applied Mathematics. Mathematical Analysis. Computation. Statistical Engineering. Mathematical Physics.

Data Processing Systems. SEAC Engineering Group. Components and Techniques. Digital Circuitry. Digital Systems. Analog Systems. Application Engineering.

• Office of Basic Instrumentation.

• Office of Weights and Measures.

BOULDER, COLORADO

Cryogenic Engineering. Cryogenic Equipment. Cryogenic Processes. Properties of Materials. Gas Liquefaction.

Radio Propagation Physics. Upper Atmosphere Research. Ionospheric Research. Regular Propagation Services. Sun-Earth Relationships. VHF Research. Ionospheric Communication Systems.

Radio Propagation Engineering. Data Reduction Instrumentation. Modulation Systems. Navigation Systems. Radio Noise. Tropospheric Measurements. Tropospheric Analysis. Radio Systems Application Engineering. Radio Meteorology. Radio Standards. High Frequency Electrical Standards. Radio Broadcast Service. High Frequency Impedance Standards. Electronic Calibration Center. Microwave Physics. Microwave Circuit Standards.

